

**California  
Independent UST Case Closure  
Study:**

**A Quantification of Cases Potentially  
Closable Under Low-Risk Criteria**

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*Abstract*

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This Study has been performed to estimate the percentage of Leaking Underground Fuel Tank (LUFT) cases that could be closed with no further environmental corrective action if “low-risk” criteria were established and uniformly implemented across the State of California. The low-risk criteria used in this study are similar to those already established under the SFRWQCB’s *Supplemental Instructions to State Water Board December 8, 1995 Interim Guidance on Required Cleanup at Low Risk Fuel Sites*, and those set by precedent under the 14 SWRCB Water Quality Orders resulting in case closure from the petitions process under 23 Cal. Admin. Code §2814.6.

To evaluate the percentage of cases that could be closed under low risk criteria, 35 cases were randomly selected from the list of cases that had been reviewed for closure under the UST Cleanup Fund’s 5-Year Review established by Cal. Health & Safety Code §25299.39.2. Once the randomly identified sites were selected, site environmental conditions were evaluated using the reports, data, and correspondence that had been uploaded to the State’s GeoTracker Database by the claimant or their agent. Site environmental data were compared with the low-risk criteria developed by the SFRWQCB’s Supplemental Instructions and the 14 Water Quality Orders. On the basis of these criteria and precedents, an independent evaluation was made on a case-by-case basis whether the subject case could be considered eligible for low-risk closure.

The results of this evaluation found that 12 of the 35 environmental cases reviewed meet low-risk criteria and should be considered for No Further Action status (closure) without any further corrective action. This indicates that approximately 34% of the overall caseload qualifies for low-risk closure if the criteria described above were to be adopted. If extrapolated to the overall UST caseload in California, approximately 3,480 cases could meet low-risk criteria and be closed with no further corrective action. With respect to the UST Cleanup Fund, it is estimated 1,400 cases with active Letters of Commitment could be closed if the results of this study are representative.

The study concludes that a substantial number of cases throughout California could be closed if low-risk criteria were uniformly applied across the state. If these cases were to be closed, it is believed that the impact to human health and environmental receptors would be negligible, but the cost savings to the UST Cleanup Fund, self funded responsible parties, and the people of the State of California would be enormous.

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*Acknowledgements*

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The State Water Resources Control Board's UST Program Task Force (2009-2010) is in general agreement with the methodology, criteria, and conclusions of this study. While the Task Force did not independently validate each of the case reviews presented in this study, the Task Force recognizes that implementation of a risk-based approach to environmental case closure, based on existing guidelines and precedents, could have a substantial impact on the UST Cleanup Program and the UST Cleanup Fund.

The California Independent Oil Marketers Association fully endorses this study and strongly supports the use of risk-based decision making processes in evaluating closure of underground storage tank cases.

This study, including research and analysis, comments and conclusions is strictly the work of Ronald D. Chinn, P.E. and Closure Solutions, Inc. Although partial funding for the study was provided by Western States Petroleum Association, the study, comments, an conclusions are strictly those of the author, and do not necessarily represent the views of Western States Petroleum Association.

## **1.0 PURPOSE**

The purpose of this study is to provide a statewide estimate of the overall number of open Leaking Underground Fuel Tank (LUFT) environmental cases that could be closed with no additional investigative or remedial work<sup>1</sup> if a uniform risk-based approach to environmental case closure were to be applied across the State of California.

The uniform risk-based approach considers the low-risk criteria established under San Francisco Regional Water Quality Control Board's (SFRWQCB) *Supplemental Instructions to State Water Board December 8, 1995 Interim Guidance on Required Cleanup at Low Risk Fuel Sites* (January 5, 1996)<sup>2</sup>, as well as the precedents established by the State Water Resources Control Board (SWRCB) in the 14 Water Quality Orders resulting in case closure from the closure petitions process established by 23 Cal. Admin. Code §2814.6 *et seq.* (the "Petition Process"). Additionally, this study incorporates results from studies regarding the fate and transport of petroleum hydrocarbons and fuel oxygenates such as Methyl-Tertiary Butyl Ether (MTBE).

The low-risk evaluation criteria established under the SFRWQCB's *Supplemental Instructions to State Water Board December 8, 1995 Interim Guidance on Required Cleanup at Low Risk Fuel Sites* are:

- The leak has been stopped and ongoing sources, including free product, removed or remediated;
- The site has been adequately characterized;
- The dissolved hydrocarbon plume is not migrating;
- No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted;
- The site presents no significant risk to human health;
- The site presents no significant risk to the environment.

The 14 Water Quality Orders resulting from closure petitions are:

- WQO 98-03                      Kenneth and Jean Fortenberry

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<sup>1</sup> For the purposes of this study, "additional investigative or remedial work" does not include preparation of a request for No Further Action status and non-environmental site restoration activities such as proper destruction of wells and removal of remediation equipment.

<sup>2</sup> SFRWQCB *Supplemental Instructions to State Water Board December 8, 1995 Interim Guidance on Required Cleanup at Low Risk Fuel Sites* (January 5, 1996) was prepared in response to the December 8, 1995 memo from Walter Pettit entitled *Lawrence Livermore National Laboratories (LLNL) Report on Leaking Underground Storage Tank (UST) Cleanup*.



- WQO 98-04                Matthew Walker
- WQO 98-08                Texaco Refining and Marketing, Inc.
- WQO 98-10                Margo Hayes
- WQO 98-12                Unocal Corporation, Gilroy
- WQO 98-13                Landis Incorporated
- WQO 99-04                Fallbrook Public Utility District
- WQO 2003-0001           Michael O'Donoghue Trust
- WQO 2003-0011           Sui Lau and Yut Bing Leung Lau
- WQO 2004-0018           Ernest Panosian
- WQO 2005-0002           Lois Green and Patricia Kelly
- WQO 2005-0008           Dan Thomas
- WQO 2005-0011           Purves Family Trust
- WQO 2008-0003           Shell Oil Products US

The fate and transport studies used to evaluate migration of petroleum hydrocarbons and fuel oxygenates include:

- *California Leaking Underground Fuel Tank (LUFT) Historical Case Analyses*, Lawrence Livermore National Laboratories, 1995;
- *An Evaluation of MTBE Impacts to California Groundwater Resources*, Lawrence Livermore National Laboratories, 1998;
- *Evaluation of the Impact of Fuel Hydrocarbons and Oxygenates on Groundwater Resources*; Shih, T.; Rong, Y., Harmon, T., Suffet, M., 2004.

## **2.0 Methodology**

The purpose of this study is to estimate the percentage of currently active Underground Storage Tank (UST) cases that could be granted No Further Action status if low-risk criteria were used in the evaluation of case closure. In order to estimate this percentage, the following assumptions were made:

- 1) 10,154 active LUFT cases statewide<sup>3</sup>
- 2) 4,094 active Letters of Commitment<sup>4</sup>
- 3) 1,344 cases reviewed by 5-Year Review concurring case should remain open<sup>5</sup>
- 4) 338 cases reviewed by 5-Year Review and recommended for closure<sup>6</sup>;

For the purposes of this study, the author assumes that the cases reviewed under the authority of Cal. Health & Safety Code §25299.39.2 (the UST Cleanup Fund “5-Year Review”) are representative of the overall environmental LUFT caseload in California.

The set of cases considered under this study is composed solely of cases that had been previously evaluated by the 5-Year Review program. The reason that the 5-Year Review cases were selected as the representative data set was purely practical; these cases were known to have complied with the Electronic Submittal of Information to the State’s GeoTracker Database, and therefore environmental case information since 2005 is readily available online for review and consideration.

The author recognizes that the assumption that the 5-Year Review cases are representative of the statewide LUFT caseload is not well supported and may induce a bias in the study results. Known biases include:

1. Procedurally, the 5-Year Review evaluates only cases that upload data to the State’s GeoTracker Database. Claimants that upload data to GeoTracker are more likely to be responsive and actively engaged in case management. *Net effect: study may over-represent the percentage of overall cases that could be closed.*
2. Claimants on the Priority List (i.e. claimants that are awaiting a Letter of Commitment and do not yet have access to the UST Cleanup Fund) are typically large corporations and major oil companies such as BP, Chevron, Shell, etc. These claimants tend to employ highly qualified professional environmental consulting firms and are highly engaged in the management of their cases. *Net*

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<sup>3</sup> Source: Electronic communication, Joel Coffman, PG, Underground Storage Tanks Program, US Environmental Protection Agency

<sup>4</sup> Source: Monthly Underground Storage Tank (UST) Cleanup Fund Program Statistics, October 30, 2009

<sup>5</sup> Source: Electronic communication, Robert Trommer, CHG, Chief, 5-Year Review Unit, UST Cleanup Fund

<sup>6</sup> Source: Electronic communication, Robert Trommer, CHG, Chief, 5-Year Review Unit, UST Cleanup Fund

*effect: study may under-represent the percentage of overall cases that could be closed.*

3. It is believed that a disproportionately large percentage of cases are granted No Further Action Status before the age of the Letter of Commitment reaches 5 years. In many of these cases, the corrective action at the site solely consists of investigation and monitoring of an insignificant release that is ultimately determined to pose no threat to human health or environmental receptors, and the case is closed before becoming eligible for the 5-Year Review. *Net effect: study may under-represent the percentage of overall cases that could be closed.*

The overall effect and magnitude of the biases are unknown. It is noted that the cases selected for evaluation by the 5-Year Review are randomly selected<sup>7</sup>, and therefore should not induce bias.

Using the latest information provided by the UST Cleanup Fund, the author obtained a current list of all open cases that had been reviewed by the 5-Year Review and sorted the caseload into the following two categories:

- 1) Cases where 5-Year Review concurred with current corrective action or recommended additional corrective action (1,344 cases)
- 2) Cases recommended for closure by 5-Year Review (338 cases)

To approximate the relative percentage of cases recommended as open vs. closed by the 5-Year Review (79.9% open vs. 20.1% closed), the author randomly<sup>8</sup> selected 28 cases from the recommended open list, and 7 cases from the recommended closed list (80.0% open vs. 20.0% closed).

Once the randomly identified sites were selected, site environmental conditions were evaluated using the reports, data, and correspondence that had been uploaded to the State's GeoTracker Database by the claimant or their agent. In certain cases, the responsible party or their consultant was contacted to clarify issues relating to the environmental case.

Site environmental data were compared with the low-risk criteria developed by the SFRWQCB's Supplemental Instructions and the 14 Water Quality Orders resulting from closure petitions. On the basis of these guidelines and precedents, an independent evaluation was made on a case-by-case basis whether the subject case could be considered eligible for low-risk closure.

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<sup>7</sup> Source: Electronic communication, Robert Trommer, CHG, Chief, 5-Year Review Unit UST Cleanup Fund

<sup>8</sup> Random selection of cases was performed using a random number generator provided by RANDOM.ORG.

Upon completion of the site-specific evaluations, the relative percentages of cases considered closable as low-risk were compared against those where environmental conditions did not warrant closure. This relative percentage was extrapolated to the number of open LUFT cases in California to estimate the total number of cases that could be closed if low-risk criteria were used.

## **3.0 CRITERIA & GUIDELINES**

When evaluating cases for potential low-risk closure, the author predominantly used the criteria established under the SFRWQCB's *Supplemental Instructions to State Water Board December 8, 1995 Interim Guidance on Required Cleanup at Low Risk Fuel Sites* as well as the precedents set under the 14 Water Quality Orders resulting in case closure from SWRCB closure petitions. While the criteria necessarily require independent professional judgment and do not lend themselves well to codification, certain criteria and guidelines could be used to establish whether the case should qualify for low-risk closure. These criteria and guidelines are presented below.

### **3.1 Free Product Removal & Remediation**

*The leak has been stopped and ongoing sources, including free product, removed or remediated to the extent practicable.*

23 CCR Division 3, Chapter 16 §2655 requires that the owner or operator remove free product to the maximum extent practicable, as determined by the local agency. This requirement does not imply that all traces of free product must be removed; it must only be done so to the extent practicable. Section 2655 also makes clear that the primary purpose of product removal is to abate migration. If the responsible party has removed free product to the extent that it is technically and economically feasible *with respect to abating further migration, impacts to human health and ecological receptors*, it should be considered to be removed to the extent practicable, thereby satisfying this requirement.

### **3.2 Groundwater Contaminant Concentration**

*In general, petroleum hydrocarbon releases should be considered low-risk if the maximum concentrations in groundwater are less than:*

- *10,000 ug/L for TPHg and for TPHd*
- *1,000 ug/L for each individual petroleum hydrocarbon constituent*
- *500 ug/L for each individual fuel oxygenate*

*TPHg and TPHd concentrations should be used as an indicator of gross contamination; the concentration of TPH in and of itself should not be used as a regulatory driver. LUFT cases that do not contain appreciable concentrations of benzene or MTBE should be considered 'low-risk' irrespective of TPH concentration.*

Modern formulations of gasoline typically consist of several hundred individual chemicals, of which benzene is generally considered to be the most important constituent in terms of potential toxicity. Gasoline releases prior to 1990 typically do not contain an

appreciable fraction of MTBE<sup>9</sup>, and the benzene concentrations of many of these releases is insignificant due to biodegradation and/or volatilization over time. In cases where the TPH concentration is high, but MTBE and benzene concentrations are low or not present above laboratory detection limits, the case should be considered to be low-risk irrespective of the TPH concentration.

Note that this criterion does not imply that sites that exhibit contaminant concentrations in excess of the concentrations listed above cannot be closed, nor does it imply that cases that meet the concentration guidelines should necessarily be considered low-risk. The concentrations criterion should be considered to be guidelines for each constituent, and best professional judgment should be used to evaluate the potential risk to receptors and whether the case should be closed.

### **3.3 Plume Stability and Migration**

*A groundwater contaminant plume is considered to be stable when the source has been removed to the extent practicable and contaminant concentrations in the most highly impacted areas are stable or decreasing. Plume stability may be judged by visual interpretation of the concentration trend with respect to time, a Kendall Trend test, or a linear regression.*

With respect to more degradable and less mobile constituents such as TPH and benzene, reduction in concentration in the source area is considered evidence that the overall extent of the groundwater plume is contracting with respect to time. If the over all extent of the plume is contracting, the case should be considered low-risk. If the release is stable, adequately characterized, and consists of a pre-MTBE formulation of gasoline, the case should be considered to be low-risk.

Because MTBE tends to be less degradable and more mobile than petroleum hydrocarbon contaminants, demonstrating MTBE plume stability is more challenging unless the MTBE impacts are restricted to largely fine grained sedimentary deposits such as clay and silt. In these cases, an MTBE plume is considered to be stable when the plume is localized and connected to the source area, and an adequately placed monitoring network demonstrates that the plume is not mobile with respect to time.

Under certain conditions, MTBE is known to form a ‘detached’ plume, characterized by a discrete, low mass release that has separated from the source area. While detached plumes are typically not stable, the environmental case could still be closed if reasonable professional judgment is used with respect to the distance to known receptors in the downgradient direction, probable future use of the groundwater, and the concentration and mass of the contaminants in the detached plume.

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<sup>9</sup> Widespread use of MTBE in California occurred in the early 1990’s in response to the 1990 Federal Clean Air Act Amendments and the wintertime oxygenated fuels program implemented by the California Air Resources Board in 1992.

### **3.4 Adequate Characterization**

*A groundwater plume is considered adequately delineated when reasonable professional judgment can be used to estimate the extent of the overall plume with respect to distance to nearby receptors.*

Many regulatory agencies require that groundwater plumes are delineated to below laboratory detection limits both vertically and laterally. Furthermore, regulatory agencies commonly require detailed characterization of the source area, even though the plume may be fully delineated and stable. Under these circumstances, detailed characterization of the source area serves no useful purpose since it has no bearing on the overall plume with respect to nearby receptors. These requirements are not supported by reasonable interpretation of Resolution 92-49 and cause unnecessary investigation and expenditure by the UST Cleanup Fund or responsible parties.

### **3.5 Potential Impacts to Existing Drinking Water Wells**

*Contaminants that have a reasonable potential to impact drinking water wells due to plume migration cannot be considered low-risk. The distance considered to be adequately protective of drinking water wells vary with the mobility and persistence of the constituents of concern, and should be measured in the predominant groundwater flow direction.*

Numerous studies of the fate and transport of petroleum hydrocarbons and fuel oxygenates have been performed, including the 1995 and 1998 Lawrence Livermore Reports<sup>10,11</sup> and the 2004 Los Angeles Area Petroleum Hydrocarbon and Fuel Oxygenate Study<sup>12</sup>. These studies indicate that unabated, petroleum hydrocarbon and MTBE groundwater plumes reach a maximum length before the processes of natural attenuation, diffusion, advection and dispersion reduce the concentration to water quality objectives or levels adequately protective of human health.

The 1995 and 1998 Lawrence Livermore Reports indicate that the lateral dimensions of most (non-MTBE) LUFT sites do not exceed more than a few hundred feet, and that in 90% of cases, the benzene concentration had decreased to below 1 ug/L within 400 feet of the source area. The 2004 Los Angeles Study indicated that the longest MTBE plume length observed (5 ug/L) was approximately 1,040 feet, and that 90% of MTBE cases resulted in a plume length of 540 feet or less.

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<sup>10</sup> Lawrence Livermore National Laboratories; *Recommendations To Improve the Cleanup Process for California's Leaking Underground Fuel Tanks*, 1995

<sup>11</sup> Lawrence Livermore National Laboratories; *An Evaluation of MTBE Impacts to California Groundwater Resources*, 1998

<sup>12</sup> Shih, T; et. al.; *Evaluation of the Impact of Fuel Hydrocarbons and Oxygenates on Groundwater Resources*; Environ. Sci. Technol. 2004.

Unless the site is situated in an area with unusual geologic conditions such as fractured bedrock, a distance of 1,000 feet should be considered to be adequately protective of downgradient receptors for MTBE. In cases where MTBE and other fuel oxygenates are not present, a distance of 500 feet should be considered adequately protective of downgradient receptors.

If the contaminant consists of a pre-MTBE formulation of gasoline, the receptor should be considered adequately protected irrespective of distance if sentry wells between the source area and the receptor consistently show that water quality objectives have been met prior to reaching the receptor.

In cases where MTBE has formed a detached plume, best professional judgment should be employed to evaluate whether the contaminant has a reasonable likelihood of impacting an existing downgradient receptor before the processes of natural attenuation, advection, dispersion and diffusion reduce the concentrations to below Water Quality Objectives.

### **3.6 Achievement of Water Quality Objectives Before Resource Used**

*Unless the water within the contaminant plume itself has an actual or probable beneficial use, it is inappropriate to require that Water Quality Objectives be met at the time of case closure. Closure should be granted if Water Quality Objectives would be reached in a “reasonable timeframe”, based on actual or probable beneficial use.*

It is recognized that domestic drinking water wells are not commonly being installed in urban environments already serviced by municipal drinking water sources. Typically, municipal wells are installed at greater depth, with a more robust sanitary seal, and are subjected to frequent water quality evaluations to ensure that contaminant impacts are recognized and appropriate action taken to protect public safety. This implies that in areas already serviced by municipal sources, groundwater in shallow water bearing zones is not likely to be used for drinking water purposes except in the immediate vicinity of existing wells, if any. Releases from petroleum USTs, which typically only impact the shallowest water bearing zones, should not be prevented from case closure unless it can be reasonably expected that water quality objectives will not be met prior to impacting existing wells, or wells that have a reasonable expectation of being installed in the future.

In the 14 Water Quality Orders resulting in case closure from SWRCB closure petitions, SWRCB clearly indicates that case closure should be granted if Water Quality Objectives will be achieved in a reasonable timeframe, based on the actual or probable beneficial use of the water. The determination of what constitutes a “reasonable timeframe” requires professional judgment, and should not be based on an arbitrary local or statewide policy number such as “20-Years” or “hundreds of years”. The judgment must be made considering the stability and size of the plume. For example, if the subject site is a gasoline service station in an urban environment already serviced by municipal water sources, and the contaminant is highly localized and defined, the probability that a drinking water well will be installed in that contaminant plume is exceedingly low, and



therefore a reasonable timeframe could be considered to be several hundred years. Likewise, if the plume extent covers several different parcels an area not serviced by municipal sources, a reasonable timeframe to achieve Water Quality Objectives could be significantly less.

### **3.7 Non-Residential Land Use in Probable Extent of Plume**

*If contaminant migration is beneath solely commercial or industrial land uses, exposure and risk to human health is significantly diminished.*

Human health risk is significantly diminished if the current and probable extent of the groundwater plume extends beneath only non-residential land uses due to decreased exposure to contaminant vapors and a decreased probability that a drinking water well will be installed in the future. The evaluation of which properties are considered to be within the probable extent of the groundwater plume requires an understanding of the mobility of the various constituents of concern, lithology, and professional judgment. For example, if the plume is localized, composed of only TPH, and concentrations are decreasing, the probable future extent of the plume may just be the property itself. If the plume is composed of high mobility constituents such as MTBE and the soils are predominantly sand, the probable future extent of the groundwater plume may extend 1,000 feet in the downgradient direction.

It is important to note that this criterion is not intended to imply that contaminant migration beneath residential properties necessarily constitutes a human health risk. It is believed that contaminant migration beneath residential properties very rarely constitutes a threat to human health unless very high concentrations of contaminants are present (e.g. an order or magnitude or higher than the concentration guidelines presented in Section 3.2), or a well is located within the plume. This criterion is only intended to suggest that the land use within the probable extent of the groundwater plume should be considered in a closure risk evaluation, and that if the land use is solely commercial or industrial, the migration of contaminants beneath nearby properties should not, in and of itself, be considered an impediment to closure.

### **3.8 Potential Impacts to Human Health**

*Cases that pose an insignificant risk to human health should be considered for low-risk closure. The primary means of impacting human health are considered to be ingestion of impacted drinking water and inhalation of soil vapor.*

A human health risk assessment is not necessarily required to evaluate potential impacts to human health if reasonable professional judgment is used. The primary means of impacting human health include inhalation of soil vapor and ingestion of contaminants through drinking water sources. Ingestion of contaminants adsorbed to soil particles is not considered to be a significant means of exposure in a non-residential setting, and it does not appear to be reasonable public policy to keep UST cases open solely on the basis that future construction workers could potentially be dermally exposed to contaminants.

Potential impacts to indoor air quality are currently evaluated using a phased investigative approach, including 1) evaluating whether soil and groundwater contaminant levels warrant investigation of soil vapor, 2) performance of subsurface soil vapor sampling outside the building structure, 3) performance of sub-slab soil vapor sampling within the building structure, and 4) collection of indoor air quality within the building structure. Because bio-attenuation is neglected in the Johnson-Ettinger (J&E) vapor intrusion model, it is believed that this model is highly conservative when used to evaluate potential vapor intrusion into building structures. It is further believed that vapor intrusion from typical hydrocarbon sources is not likely to occur unless the source is within a couple of feet of the receptor.<sup>13</sup> As such, the failure of a Human Health Risk Assessment based on subsurface soil vapor samples collected outside of the building structure do not necessarily indicate that an actual risk to occupants exist. Remediation and abatement of soil vapors purely based on subsurface vapors outside the building structure is inappropriate.

Potential impacts to human health through ingestion of impacted drinking water are primarily evaluated by considering the distance to the nearest domestic or municipal well. In cases where a sensitive receptor survey has not been performed and the nearest well is not known, the potential impact to human health cannot be overlooked unless the plume consists of low mobility constituents, the extent of the plume is known, and the plume is stable and/or reducing.

### **3.9 Potential Impacts to Environmental Receptors**

*Cases that pose an insignificant risk to environmental receptors should be considered for low-risk closure. Unacceptable risk to environmental receptors should be evaluated within the receiving water and with respect to acute and chronic effects.*

While environmental cases situated nearby or adjacent to surface water bodies have the potential of discharging contaminants to that water body, the actual impacts to environmental receptors may be insignificant if the concentrations and toxicity to aquatic life of the contaminants are low. The presence of contaminants in groundwater immediately adjacent to a water body should not necessarily be considered a threat to the water body unless it can be demonstrated that those contaminants pose an unacceptable risk to aquatic life within that receiving water body. It is noted that anti-degradation policy with respect to point source discharges into surface water bodies allow for a 'zone of mixing', and that the regulatory point of compliance is at the end of the zone.

The determination of unacceptable risk must be made with respect to acute and chronic effects to aquatic species within the receiving water body. Remediation and mitigation of contaminants in groundwater for the sole purpose of preventing contaminant contribution to water body is unwarranted unless the actual impact is understood with respect to aquatic life.

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<sup>13</sup> R. Davis; *Vapor Attenuation in the Subsurface from Petroleum Hydrocarbon Sources*; May 2006; LUSTLine Bulletin 52

## **4.0 RESULTS**

Of the 35 environmental cases reviewed, 12 cases were found to meet low-risk criteria and should be considered for No Further Action status (closure). This indicates that approximately 34%<sup>14</sup> of the overall caseload qualifies for low-risk closure if the criteria described in the previous section were to be adopted. Five of the 7 cases recommended for closure by the UST Cleanup Fund's 5-Year Review were found to meet low-risk criteria, and 7 of the 28 cases recommended for additional corrective action by the 5-Year Review also qualified for low-risk closure. The closure review summaries are presented in Table 1 and Table 2, respectively. The individual Independent UST Case Closure Reviews for each site are presented in Attachment A.

If the results of this study are representative of the overall UST caseload in California, approximately 3,480 cases could be considered to be low-risk and closed with no further corrective action other than site restoration activities such as the destruction of wells. With respect to the UST Cleanup Fund, it is estimated 1,400 cases with active Letters of Commitment could be closed if the results of this study are representative.

Of the cases that were not considered closable under this study (23 of 35 cases reviewed), this study observes the following:

- 65% of cases (15 of 23) were not recommended for closure due to contaminant concentrations in excess of low-risk criteria guidelines;
- 17% of cases (4 of 23) reported the presence of free phase product. None of these cases had demonstrated that free product had been removed to the extent practicable. An additional 9% (2 of 23) cases reported concentrations of hydrocarbons consistent with the presence of free product;
- 65% of cases (15 of 23) were not adequately characterized, indicating that either the extent of the plume was unknown, or the behavior of the plume was not well understood;
- 39% of cases (9 of 23) were found to have plumes that were migrating or not stable. An additional 17% (4 of 23) cases were suspected of plume migration or instability, but could not be confirmed typically due to inadequate characterization;
- 43% of cases (10 of 23) were found to have plumes that extended, or would likely extend beneath residential properties. In an additional 13% of cases (3 of 23), it was unknown whether the plume would extend beneath residential properties

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<sup>14</sup> The margin of error of this study is approximately 13% using a 90% confidence level, therefore the percentage of cases considered to be eligible for low-risk closure should be considered to be 34% +/- 13%.

either due to inadequate characterization or the nature of the contaminants. Note that this criterion does not imply that migration of contaminants beneath residential properties necessarily constitute a human health risk;

- 43% of cases (10 of 23) were found to have the potential to impact water wells. In many of these cases, the reason that the plumes were considered to have a potential to impact wells was merely because a sensitive receptor survey identifying the location of wells had not been performed. Note that a sensitive receptor survey is not necessarily needed to evaluate potential impacts to nearby wells if the contaminants consist of low mobility constituents and the extent of the plume is known.
- 48% of cases (11 of 23) were found to have contaminants that may not reach water quality objectives before the resource is ultimately used. Cases that fall within this category tend to either contain high concentrations of constituents that tend to persist in the environment, or a sensitive receptor survey had not been performed to assist in the evaluation of current water usage in the vicinity of the site.
- In one case (C1- Triple S Tires), contaminants were considered to impact surface water adjacent to the site, however it is noted that the contaminant is tetrachloroethylene (PCE), and there is a strong possibility that this contaminant is not related to the release from the site. In one additional case (O19 – S.F. Oakland Truck Stop), there is potential for contaminants to reach an adjacent surface water body, however due to inadequate characterization, it cannot be determined if such impacts exist. Note that it is outside the scope of this study to evaluate whether the contaminants entering into the receiving water body pose an unacceptable threat to aquatic life.
- 13% of cases (3 of 23) were considered to pose a potential threat to human health. In each of these cases, the reason that the potential threat is considered to exist is because subsurface soil vapor concentrations indicated that cancer risk may exceed the residential or commercial exposure limit of 1E-06. It is noted that the exceedance of the exposure limit in subsurface soil samples outside the perimeter of the building structure does not necessarily indicate that indoor air quality is impacted to an unacceptable degree – only that further investigation is warranted. In 57% of cases (13 of 23), the potential risk to human health was considered to be unknown. Typically, the potential risk was considered to be unknown because a sensitive receptor survey was not available on GeoTracker, and the location of drinking water wells could not be evaluated.
- In two cases, the potential for contaminants to impact environmental receptors were considered to be unknown. These cases are the same cases identified as potentially impacting surface water bodies (C1 – Triple S Tires and O19 – S.F. Oakland Truck Stop).

## **5.0 CONCLUSIONS**

UST Cases in California are currently not regulated using a uniform risk based decision-making process. Each agency independently establishes its own criteria for closure, typically based their interpretation of Resolution 68-16, Resolution 88-63, and Resolution 92-49. In many cases, this results in significant over-regulation of environmental cases, as the closure standards are interpreted by the agency to be equivalent to drinking water standards or lower, irrespective of the distance to the receptor or whether the water will ever have a reasonable likelihood of being used.

The current regulation of UST cases does not appear to bear a strong relationship to actual risk to human health or proximity to drinking water wells. This is evidenced by the fact that in 54% of the cases reviewed (19 of 35), the distance to the nearest drinking water well was not even identified in documents available in GeoTracker. In cases that were recommended for closure by the 5-Year Review, 71% (5 of 7) provided information about the nearest receptor on GeoTracker. Of cases that were not recommended for closure by the 5-Year Review, only 39% (11 of 28) provided information about the nearest receptor on GeoTracker. If it is assumed that cases recommended for closure by the 5-Year Review are closer to completion of corrective action than those not recommended for closure (i.e. further investigation and/or remediation required), this implies that Sensitive Receptor Surveys tend to be performed later in the corrective action process, and used as an impediment to closure rather than a driver of the environmental corrective action.

Surprisingly, this approach is not unreasonable if virtually all groundwater is considered drinking water. If the agency interprets all groundwater to be drinking water in accordance with Resolution 88-63, the location at which the water is actually being withdrawn and used is immaterial, and therefore a Sensitive Receptor Survey is unnecessary. On the other hand, if the agencies develop closure policy in accordance with Resolution 92-49 and interpret that Water Quality Objectives be met at some time in the future, so long as those Water Quality Objectives are met before the resource is used, the performance of a Sensitive Receptor Survey becomes of paramount importance. It is believed that if the latter approach is employed statewide, a significant number of cases could be closed without incurring additional risk to human health and environmental receptors.

This study concludes that if the UST Cleanup Fund's 5-Year Reviews are representative of the overall UST caseload in California, approximately 34% of cases qualify as low-risk cases could be closed with no further corrective action other than site restoration activities. If these cases were to be closed, it is believed that the impact to human health and environmental receptors would be negligible, but the cost savings to the UST Cleanup Fund, self funded responsible parties, and the people of the State of California would be enormous.

**Table 1**  
**INDEPENDENT UST CASE CLOSURE REVIEW**  
 UST Cleanup Fund 5-Year Review  
 Recommended Closed

Study No.	Claim No.	Site Name	Site Address	Site City	Agency	Free Product Present	Excessive GW Concentrations	Plume Not Stable / Migrating	Inadequate Characterization	Wells Potentially Impacted	WQO's Not Reached Before Used	Potential Land Use Residential	Potential Human Health Risk	Discharges to Surface Water	Recommendation
C1	412	Triple S Tires	164 Calistoga Rd	Santa Rosa	Sonoma LOP			UNK		UNK	UNK		UNK	UNK	Not Ready For Closure
C2	986	Valley Convenience Store #5	1108 Main St	St. Helena	Napa LOP										Ready For Closure
C3	1884	Bar-Ale	17 Copeland St	Petaluma	Region 2										Ready For Closure
C4	2757	Redwood Cardlock	401 Healdsburg Ave	Healdsburg	Region 1										Ready For Closure
C5	7909	Circle K# 5423	7796 Sunrise Blvd	Citrus Heights	Sacramento LOP										Ready For Closure
C6	13084	John's Chevron Station	3595 Sagunto St	Santa Ynez	Santa Barbara LOP										Ready For Closure
C7	15090	Ramos Oil	210 G St	Lincoln	Region 5S					UNK		UNK			Not Ready For Closure

**INDEPENDENT UST CASE CLOSURE REVIEW**  
UST Cleanup Fund 5-Year Review  
Recommended Closed

[illegible]

## **Attachment A**

### **Independent Case Closure Reviews**



## Independent UST Case Closure Review

<b>Site Name</b>	Triple S Tires – Former Dave’s Pit Stop
<b>Site Address</b>	164 Calistoga Road Santa Rosa, CA
<b>Lead Agency</b>	North Coast RWQCB (R1)
<b>USTCF Claim No.</b>	412 (\$368,428)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHd	--	--	--
TPHg	900	MW-1	Decreasing (v)
Benzene	ND <0.5	--	--
MTBE	8.3	MW-1	Decreasing (v)
PCE	19	MW-2R	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor?	775 ft

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	UNK
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	Yes
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	UNK

### Regulatory Status & Directives

- Reports were rejected in GeoTracker due to PCE data being omitted.
- Waiting for one more sampling event to evaluate if additional corrective action is necessary.

### Closure Evaluation

- PCE is present in site wells, but it is believed to have migrated on to the site from an off-site source. This, however, has not been fully substantiated to the regulatory agency.
- The presence of PCE at the site has not been adequately evaluated.
- Petroleum hydrocarbons at the site have significantly reduced since remedial excavation activities.
- Petroleum hydrocarbons and MTBE are present at concentrations unlikely to present a significant risk to human health or the environment
- Groundwater is at ~ 5' bgs
- The nearby creek represents a potential environmental receptor.
- Domestic well sampling indicates that it has not been impacted by site contaminants
- If PCE can be demonstrated to be from an off-site source, case should be closed.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: PCE present in site wells – source unknown. If source is not related to site activities, case should be closed.

Footpath

Creek Greenbelt

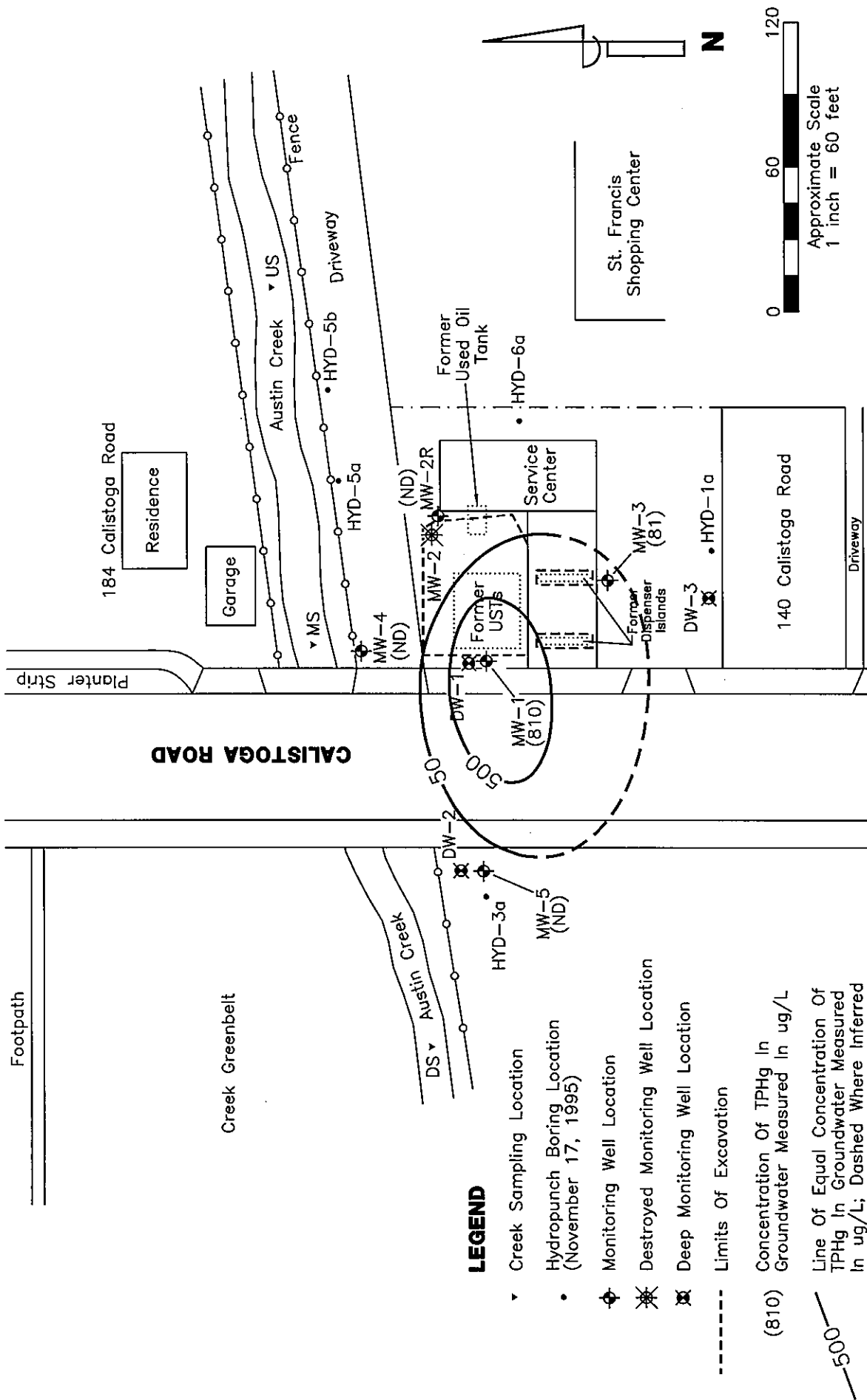
# LEGEND

- ▼ Creek Sampling Location
- Hydropunch Boring Location (November 17, 1995)
- ⊕ Monitoring Well Location
- ⊗ Destroyed Monitoring Well Location
- ⊗ Deep Monitoring Well Location
- Limits Of Excavation

(810) Concentration Of TPHg In Groundwater Measured In ug/L

Line Of Equal Concentration Of TPHg In Groundwater Measured In ug/L; Dashed Where Inferred

(ND) Not Detected



## SHALLOW-ZONE TPHg IN GROUNDWATER ISOCONCENTRATION

MAP, JUNE 18, 2009

DRAWN BY: D. Alston  
DATE: 7/7/09

REVISIONS



FIGURE

5

Former Dave's Pit Stop No. 1  
164 Calistoga Road  
Santa Rosa, California

PROJECT NUMBER:

ERA02.028

## Independent UST Case Closure Review

<b>Site Name</b>	Valley Convenience Store #5
<b>Site Address</b>	1108 Main Street St. Helena, California
<b>Lead Agency</b>	Napa County
<b>USTCF Claim No.</b>	986 (\$918,191)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	1600	EW-4	Stable (v)
<b>Benzene</b>	ND<0.5	MW-10	Decreasing(v)
<b>MTBE</b>	16	MW-5	Decreasing(v)

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes (nearby Site)
Distance to Nearest Receptor	300' (crossgradient)

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

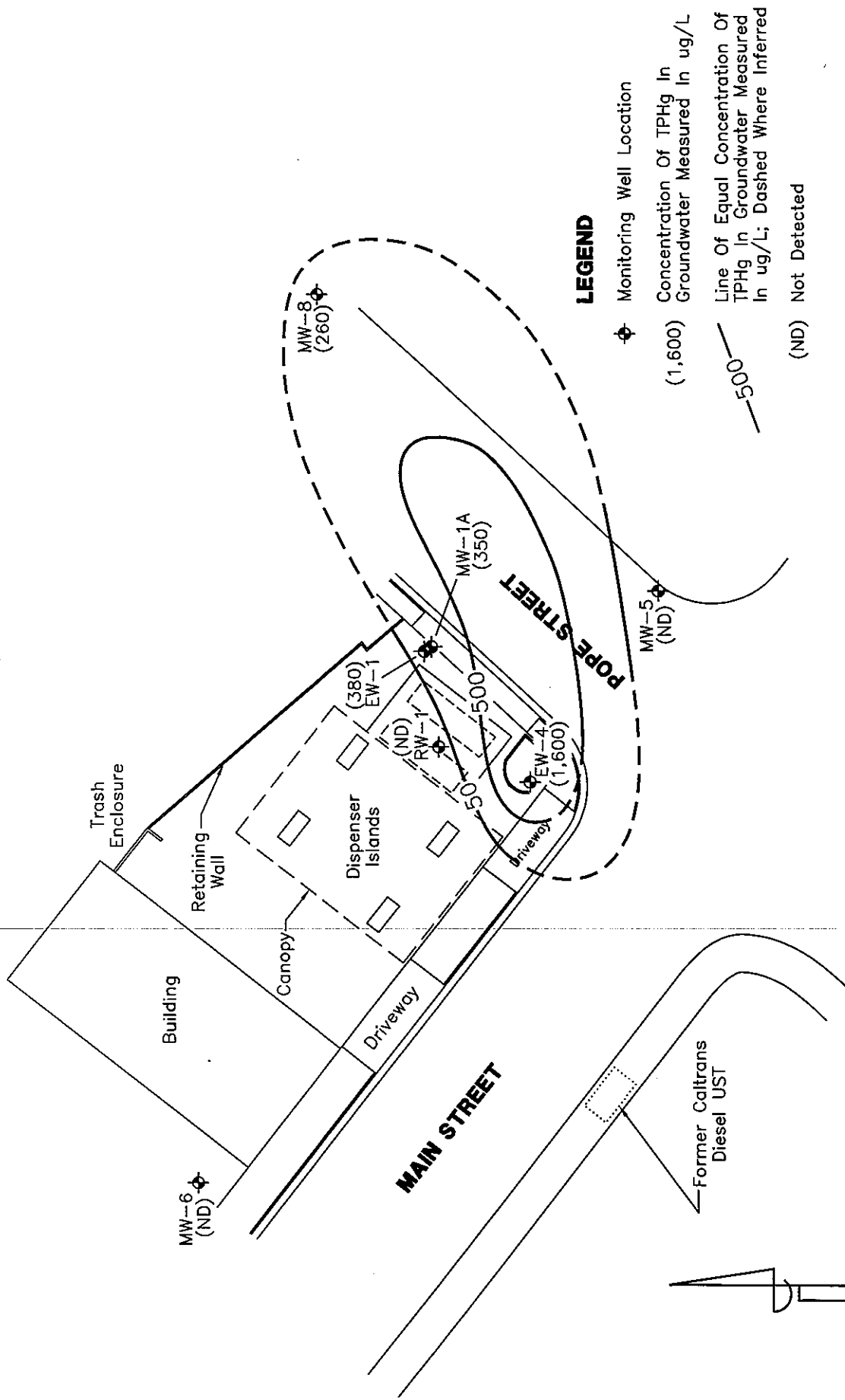
### Closure Evaluation

- Groundwater at ~4 to 5' bgs
- Trend analysis demonstrates that constituents of concern across the site are decreasing with respect to time with exception to TPHg in well EW-4. With exception to EW-4, all wells should reach WQO's within 5 years.
- EW-4 is located on-site and does not contain benzene, indicating that the contaminants are old. TPHg has limited mobility when the volatile fraction has been removed.
- MTBE concentrations are low and cannot reasonably be considered a threat to human health and the environment
- Further Active Remediation does not appear to be warranted at the current contaminant concentrations.

### Recommendation

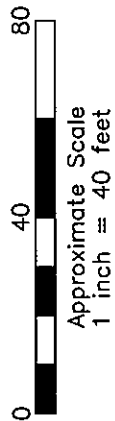
Should be granted No Further Action status; does not warrant further regulation.

Reason: TPH concentrations are decreasing and plume is stable; MTBE concentrations are low and unlikely to impact human health or environment.



Source: Figure Modified From Survey Provided By Morrow Surveying.

<b>TPHg IN GROUNDWATER ISOCONCENTRATION</b> <b>MAP, SEPTEMBER 15, 2009</b>		<b>FIGURE</b> <b>4</b>	
DRAWN BY: D. Alston DATE: 10/1/09		PROJECT NUMBER: VCS52.002	
REVISIONS		Vintage Beacon/Valley Convenience Store No. 5 1108 Main Street St. Helena, California	



## Independent UST Case Closure Review

<b>Site Name</b>	BAR-ALE
<b>Site Address</b>	17 Copeland Street Petaluma, CA
<b>Lead Agency</b>	San Francisco Bay RWQCB (R2)
<b>USTCF Claim No.</b>	1884 (\$349,619)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHd	ND<50	--	--
TPHg	ND<50	--	--
Benzene	ND<0.5	--	--
MTBE	ND<0.5	--	--
DIPE	8.7	MW-5	Decreasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor?	1,000 ft

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- No Regulatory correspondence since December 2007.

#### Closure Evaluation

- Groundwater is at ~6 to 7' bgs
- Extensive excavation activities removed impacted soil to below residential risk screening levels. A total of 3,373 tons of impacted soil and 12,000-gallons of groundwater was removed during excavation activities.
- Site has not been sampled since September 2008 at which time TPHg, TPHd, BTEX and fuel oxygenates were all ND with the exception of DIPE at a concentration of 8.7 ug/L.
- Closure requested in November 2008 excavation summary report.

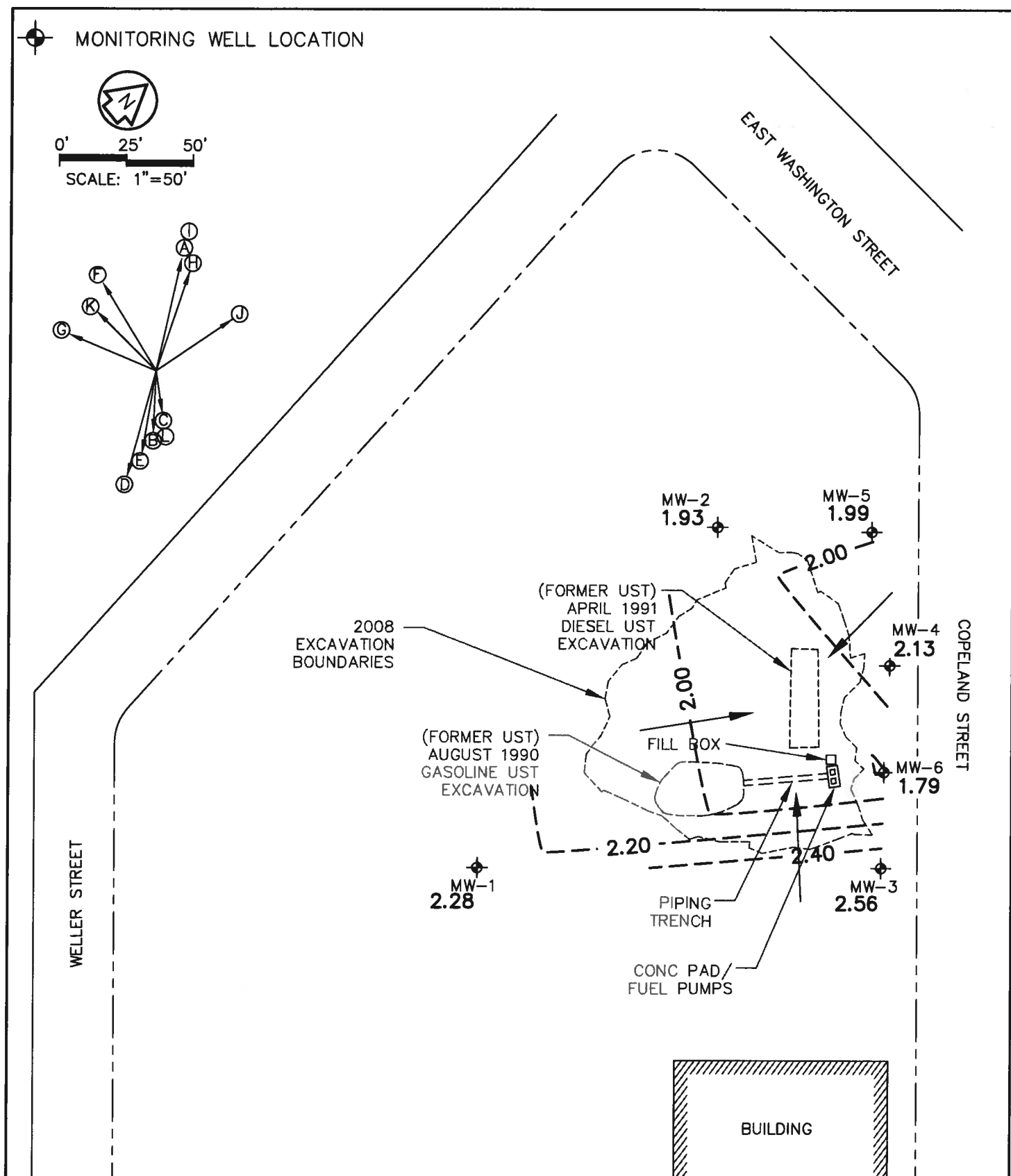
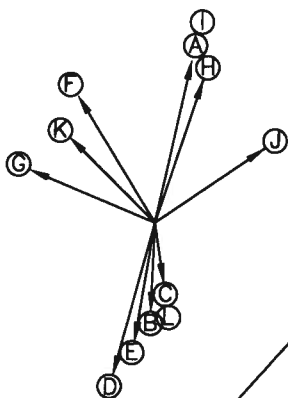
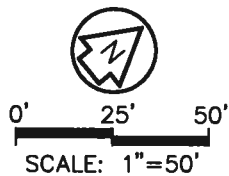
#### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Concentrations of all petroleum hydrocarbons below laboratory detection limits. DIPE present at 8.7 ug/L and decreasing.



MONITORING WELL LOCATION



**TRANS TECH CONSULTANTS**

930 SHILOH RD., BLDG 44, SUITE J  
WINDSOR, CA 95492  
PHONE: 707-575-8622 FAX: 707-837-7334

**SITE PLAN/GROUNDWATER ELEVATION  
CONTOUR MAP FOR 9/15/08**

BAR ALE  
17 COPELAND STREET  
PETALUMA, CALIFORNIA

PLATE:

2

1 OF 2

DRAWN BY:	DWG NAME:	APPR. BY:	JOB NUMBER:	W.O. NUMBER:	REVISIONS:	DATE:
JLP	1790.01 BASE	BRH	1790.01	B-218		11/18/08

## Independent UST Case Closure Review

<b>Site Name</b>	Redwood Card Lock
<b>Site Address</b>	401 Healdsburg Ave Healdsburg, CA
<b>Lead Agency</b>	North Coast RWQCB (R1)
<b>USTCF Claim No.</b>	2757 (\$711,111)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHd	ND <50	--	--
TPHg	100	MW-5	Decreasing (v)
Benzene	ND <0.5	--	--
MTBE	21	MW-5	Decreasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor?	>1000'

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Annual monitoring recommended in July 2009.

#### Closure Evaluation

- Groundwater is at ~8' bgs
- Impacted soil was excavated and impacted groundwater was pumped from the open excavation.
- Regional Board documented that the site would be ready for NFA if vertical definition was achieved and if a sensitive receptor survey was completed.
- Sensitive receptor survey indicates no domestic wells within a 500' radius of the site (door to door survey), and no municipal wells within ½ mile. Sensitive Receptor Update (2007) indicates no wells within a 1000' radius.
- Foss Creek is located approximately 200' from the site, however there is reportedly no hydraulic connection between groundwater beneath the site and the creek.
- Additional assessment was completed and reported in May 2007, no response from Regional Board is posted on GeoTracker.
- Groundwater sampling continues to support closure of site.

#### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Concentrations of petroleum hydrocarbons at or below WQO's; MTBE concentration low and unlikely to impact receptors

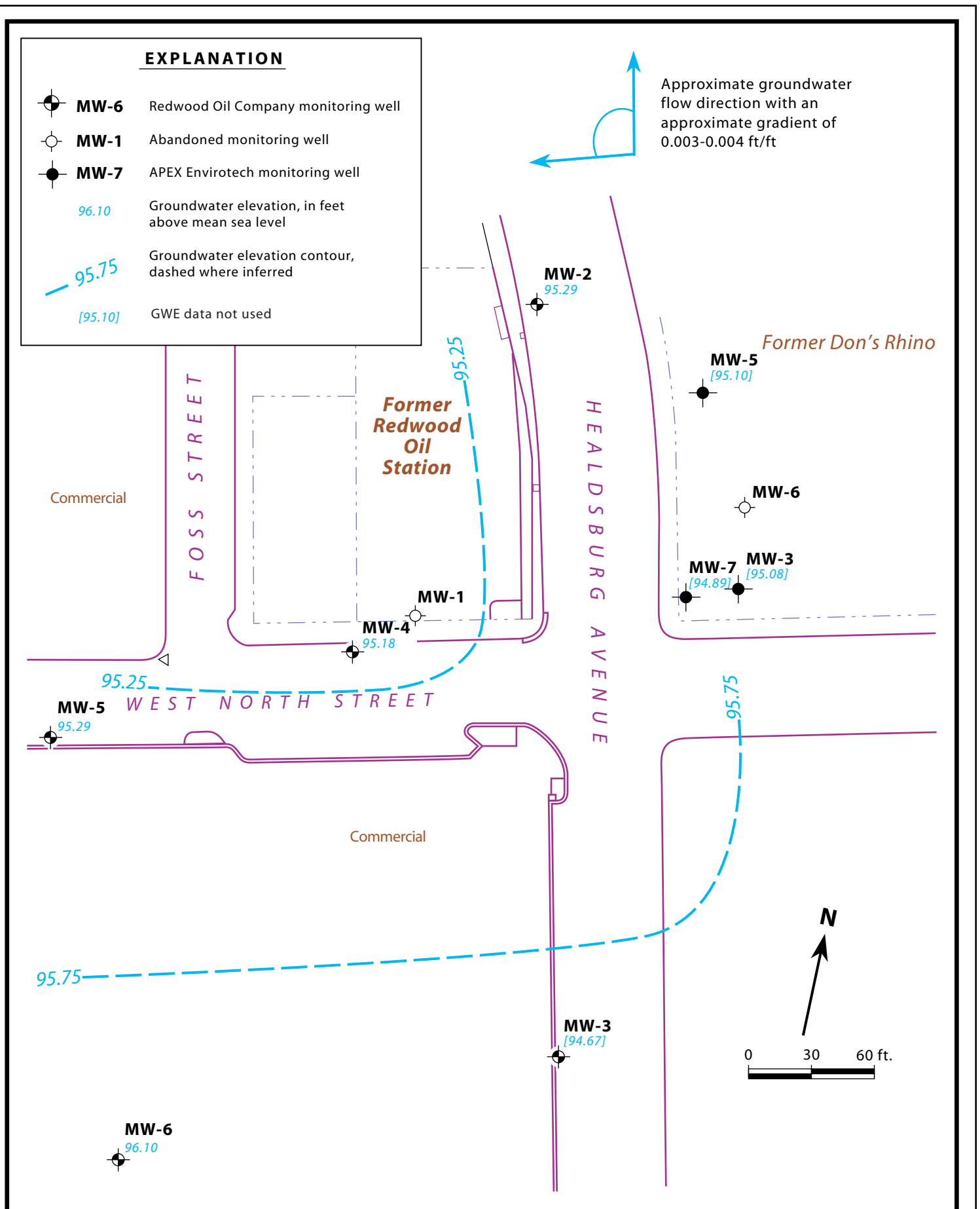


Figure 2. □ Monitoring Well Location and Groundwater Elevation Contour Map - February 6, 2009 - Former Redwood Oil Service Station #107,  
 □ 401 Healdsburg Avenue, Healdsburg, California

## Independent UST Case Closure Review

<b>Site Name</b>	Circle K #5423
<b>Site Address</b>	7796 Sunrise Blvd Citrus Heights, CA
<b>Lead Agency</b>	Sacramento County
<b>USTCF Claim No.</b>	7909 (\$86,586)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	53	MW-7	Decreasing(v)
Benzene	ND<0.5	--	--
MTBE	56	MW-7	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Performance of two more quarters of groundwater monitoring to verify a reducing trend in MW-7, then closure.

### Closure Evaluation

- Groundwater is at ~18' bgs
- Contamination on site has been reduced to below laboratory detection limits for all constituents except MTBE, which is present at 14 ug/L
- MTBE contamination is identified in off-site well MW-7 at a concentration of 56 ug/L. The MTBE concentration in this well exhibits a decreasing trend, which could be indicative of a detached plume.
- A recent off-site assessment performed in the vicinity of, and downgradient of MW-7 indicates that MTBE impacts are limited. This indicates that even if the MTBE found in MW-7 represents a detached plume, the total mass and maximum concentration is likely insignificant, and does not represent a threat to human health and ecological receptors.
- Two more quarters of groundwater monitoring is required by the agency to verify that a reducing trend is occurring in MW-7. This is based on a Sacramento County requirement that the Kendall Trend Analysis demonstrates a 95% certainty that a declining trend exists, and that a minimum of 12 sampling events occur to provide an adequate data set for accurate evaluation.
- As part of this study, Closure Solutions performed an independent Kendall Trend Analysis on the MTBE on well MW-7 from September 2005 to present. The results indicate that the MTBE concentrations are declining, with a 99.8% confidence. Based on Sacramento County guidance, it appears that this site already qualifies for closure with the existing data set.



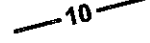
### Recommendation

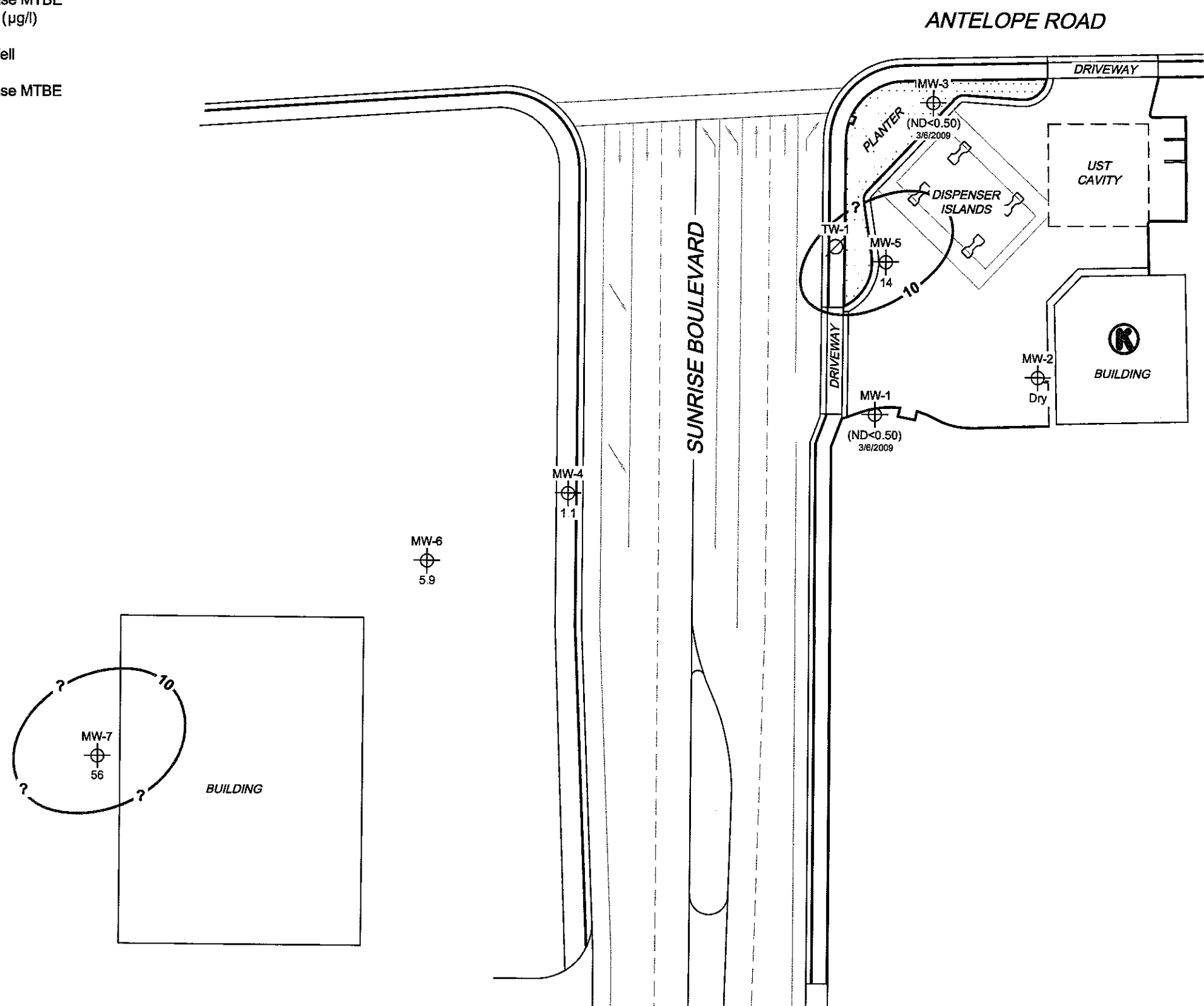
Should be granted No Further Action status; does not warrant further regulation.

Reason: TPH and benzene concentrations are low to below detection limits. MTBE plume likely detached, however represents low concentration and mass; MTBE unlikely to impact receptors.

MS=1:1 05423-003 L:\Graphics\GIS\NORTH-SOUTH\05423-000\05423-105423\05423\NEW.dwg May 28, 2009 - 9:26am sakers


LEGEND

- MW-7  Monitoring Well with Dissolved-Phase MTBE Concentration (µg/l)
- TW-1  Abandoned Well
- 10  Dissolved-Phase MTBE Contour (µg/l)



**NOTES:**

Contour lines are interpretive and based on laboratory analysis results of groundwater samples. MTBE = methyl tertiary butyl ether. µg/l = micrograms per liter. ND = not detected at limit indicated on official laboratory report. ( ) = representative historical value. UST = underground storage tank. Results obtained using EPA Method 8260B.

PROJECT:	165521
FACILITY:	CIRCLE K STORE 05423 7796 SUNRISE BOULEVARD CITRUS HEIGHTS, CALIFORNIA
DISSOLVED-PHASE MTBE CONCENTRATION MAP May 8, 2009	
	FIGURE 5

## Independent UST Case Closure Review

<b>Site Name</b>	John's Chevron Station
<b>Site Address</b>	3595 Sagunto Street Santa Ynez, CA
<b>Lead Agency</b>	Santa Barbara County LOP
<b>USTCF Claim No.</b>	13084 (\$230,701)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	18	MW-3	Decreasing (v)
Benzene	ND<0.5	--	--
MTBE	ND<0.5	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes



#### Regulatory Status & Directives

- Groundwater sampled in 1Q09.
- 10/2007 directive letter to implement RAP which includes installing 2 nested remediation wells and implementation of air-sparging and HVDPE.

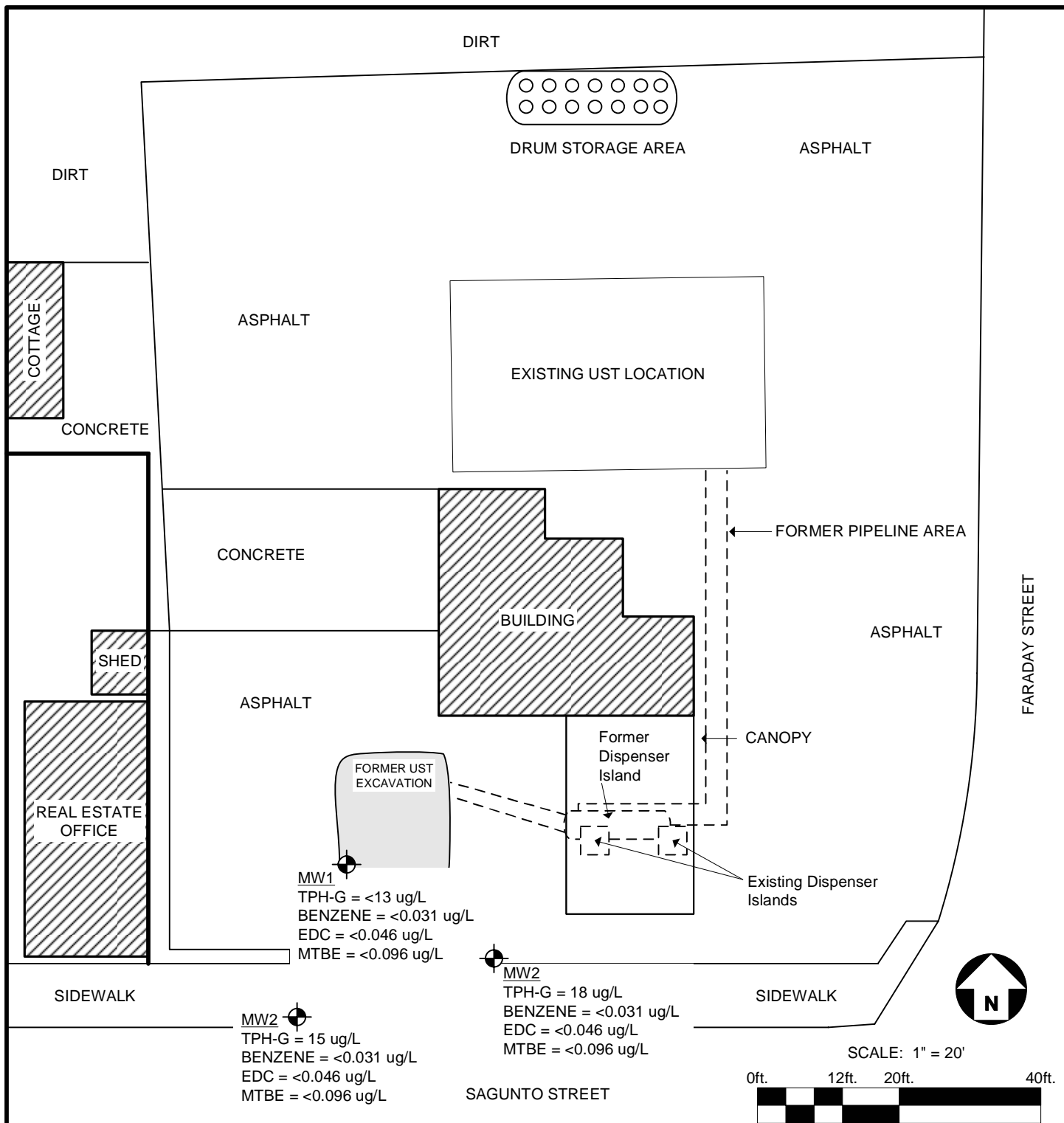
#### Closure Evaluation

- Groundwater is at ~58' bgs
- All constituents are ND in all wells except for TPHg at a concentration of 13 and 18 *micrograms* per liter. These concentrations are laboratory "j" flagged since the reporting limit is 50 ug/L.
- Site assessment in 2005 identified one location of relatively significant impact – boring B12. A grab-groundwater sample collected at this location contained 70,000 ug/L TPHg, 2,900 ug/L benzene, 56 ug/L MTBE. All other borings showed very little impact. Note that B12 is located approximately 5' from MW-1, indicating that the impact is very limited in spatial extent.
- Groundwater samples collected from borings delineate groundwater around former UST excavation.
- Groundwater gradient changes seasonally 180 degrees from northeast to southwest.
- Additional groundwater monitoring will not provide any useful information.

#### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Concentrations of constituents of concern are below WQO's.



#### KEY



**MW1**

TPH-G = 1000 ug/L\*  
BENZENE = 1.0 ug/L\*  
EDC = 0.5 ug/L\*  
MTBE = 5.0 ug/L\*

MONITORING WELL LOCATION WITH IDENTIFICATION AND CONTAMINANT CONCENTRATION REPORTED IN MICROGRAMS PER LITER (ug/L)  
\*NOTE: CONCENTRATIONS LISTED ARE MAXIMUM CONTAMINANT LEVELS (MCLs) PER LUFT/RWQCB

UST

UNDERGROUND STORAGE TANK, REMOVED SEPTEMBER 1997

#### CONTAMINANT CONCENTRATION MAP JUNE 3, 2009

JOHN'S CHEVRON STATION  
3595 SAGUNTO STREET  
SANTA YNEZ, CALIFORNIA

**DMI-EMK Environmental  
Services, Inc.**

**FIGURE 4**

DATE: 7/28/09

## Independent UST Case Closure Review

<b>Site Name</b>	Ramos Oil
<b>Site Address</b>	210 G Street Lincoln, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	15090 (\$446,612)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHd	1200	MW-10	Inc./Stable (v)
TPHg	180	MW-10	Inc./Stable (v)
Benzene	ND<0.5	--	--
MTBE	450	MW-9	Decreasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	1000' upgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

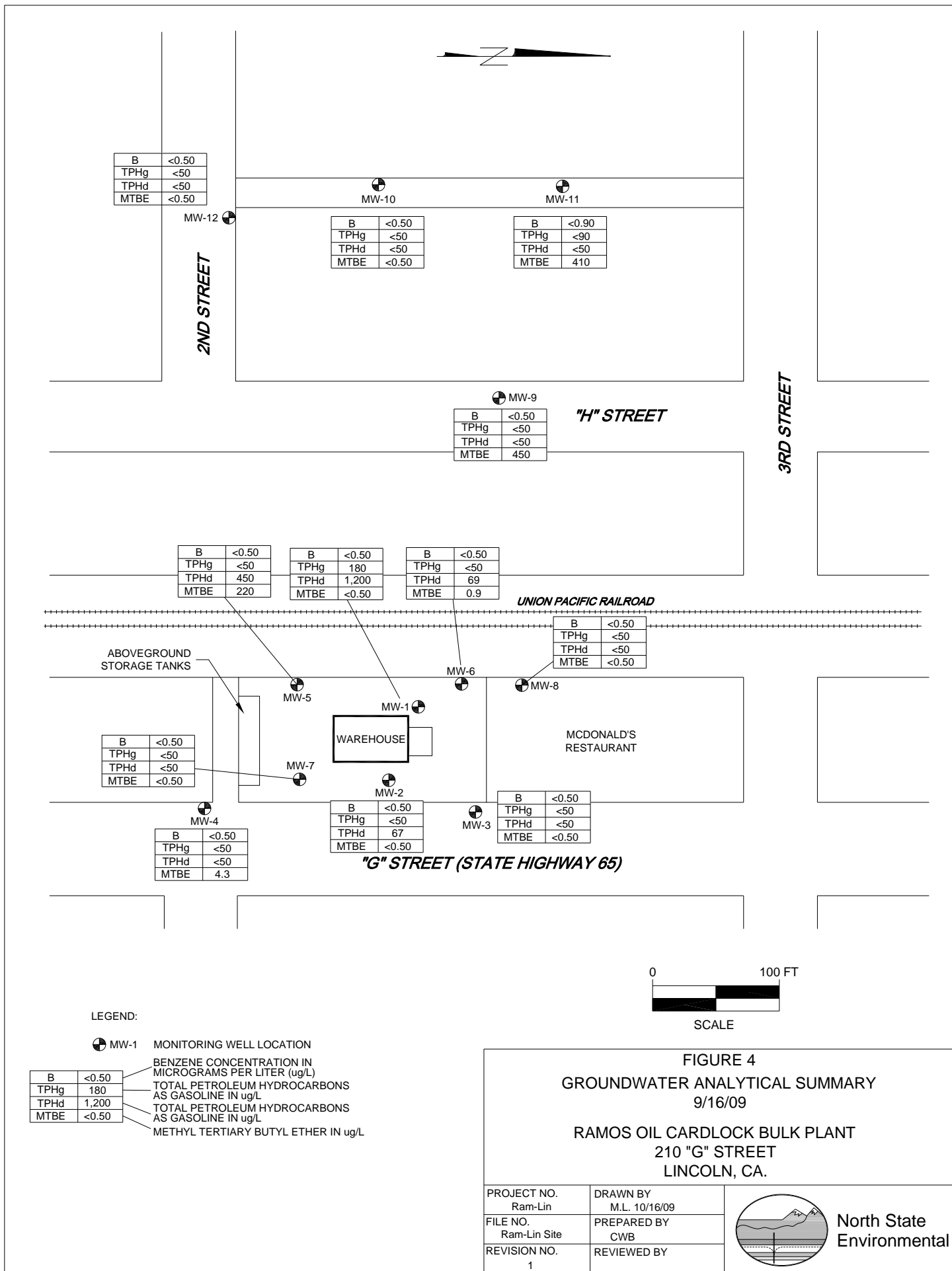
### Closure Evaluation

- Groundwater varies seasonally from ~7-8' bgs in 1Q to ~9-10' bgs in 3Q
- A soil vapor survey was conducted in 2009. Results of the survey indicate that soil vapor does not pose a significant threat to human health and welfare
- A sensitive receptor survey performed at the site indicates that the closest known drinking water well to the site is located approximately 1000' upgradient of the property. The closest known downgradient/crossgradient well is believed to be 1700' from the site.
- Diesel contamination was found in the source area during a recent remedial excavation – the extent and magnitude of the diesel impacts identified were greater than initially expected, and because of the location of existing utilities, the impacts could not be fully removed;
- Diesel is a highly immobile constituent of concern that cannot be reasonably considered a threat to existing uses of water at the concentrations found unless a well is installed within the source area
- MTBE in furthest off-site well MW-11 (410 ug/L) appears to exhibit an increasing trend, which could indicate a migrating, detached plume. The source of the MTBE is debatable – Ramos' consultant contends that the MTBE is more likely from a nearby gasoline service station with a known release, however there is insufficient data to fully support this hypothesis at this time
- The concentration in MW-11 is increasing, and if the concentration trend is similar to that found in MW-9, the concentration could ultimately reach up to 1,000 ug/L.
- MTBE is highly mobile, however given that it has been removed from the fuel supply, the MTBE discharge has clearly been stopped.
- It is extremely unlikely that the detached MTBE plume will impact the existing downgradient receptor, however due to the MTBE concentration and uncertainty with respect to plume location in the future, Water Quality Objectives may not be achieved before the resource is used.
- It may not be acceptable public policy to allow detached MTBE plumes up to 1,000 ug/L to move unchecked through the subsurface in a residential setting irrespective of the distance to the receptor.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Though exiting drinking water wells are not likely to be impacted, the concentration of MTBE may too high to degrade through the processes of advection, dispersion and natural attenuation to ensure that the contaminants will reach WOQs before the resource is used.



## Independent UST Case Closure Review

<b>Site Name</b>	Colfax Arco Mini Market
<b>Site Address</b>	504 Auburn Street South Colfax, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	502, 8533 (\$475,593)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	7,400	MW-1	Stable (v)
Benzene	4.0	MW-1	Stable (v)
MTBE	3.5	MW-2	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	1200'

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	No
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Implementation of SVE at site to remediate shallow impacted soil that continues to provide seasonal source to impacted groundwater.

### Closure Evaluation

- Groundwater is at ~13' bgs
- Surrounding land use is commercial or undeveloped – no residential in immediate vicinity
- Additional excavation was conducted during UST removal. Multiple pilot tests conducted at site. Most recent SVE conducted for 16 hrs (4 scfm(?)) and significant TPHg concentrations as high as 29,000 mg/m<sup>3</sup>.
- The contaminant plume appears to be highly localized at this time – the only significantly impacted well is MW-1. The plume appears to be laterally defined in the downgradient direction.
- The site is located on a hill with the downgradient well (MW-4) at a significantly lower elevation than onsite wells.
- Two wells are located approximately 1200' from the site. Hydrologic barriers and topography protect against migration of contaminants to these receptors.
- Concentrations of residual constituents of concern are present well above WQO's but do not appear to threaten current or probable beneficial uses. It is likely that the contaminants will degrade to WQO's before the resource is used.
- A HHRA was conducted in 2006 and the concentrations in soil and groundwater did not indicate a risk above target threshold levels for commercial property use. The July 14 2006 Risk Based Corrective Action (RBCA) Reassessment (GHH, Inc.) concludes that *"Results of the RBCA assessment indicate that target risk levels are not met. Based on this assessment, it is GHH's opinion that the concentration of impacted soil and groundwater are at acceptable levels for site closure."*
- The Additional Site Assessment and Soil Vapor Survey Report (June 2008) revises the HHRA and indicates that cancer risk (8.30E-3) is above the target level of 1E-6.

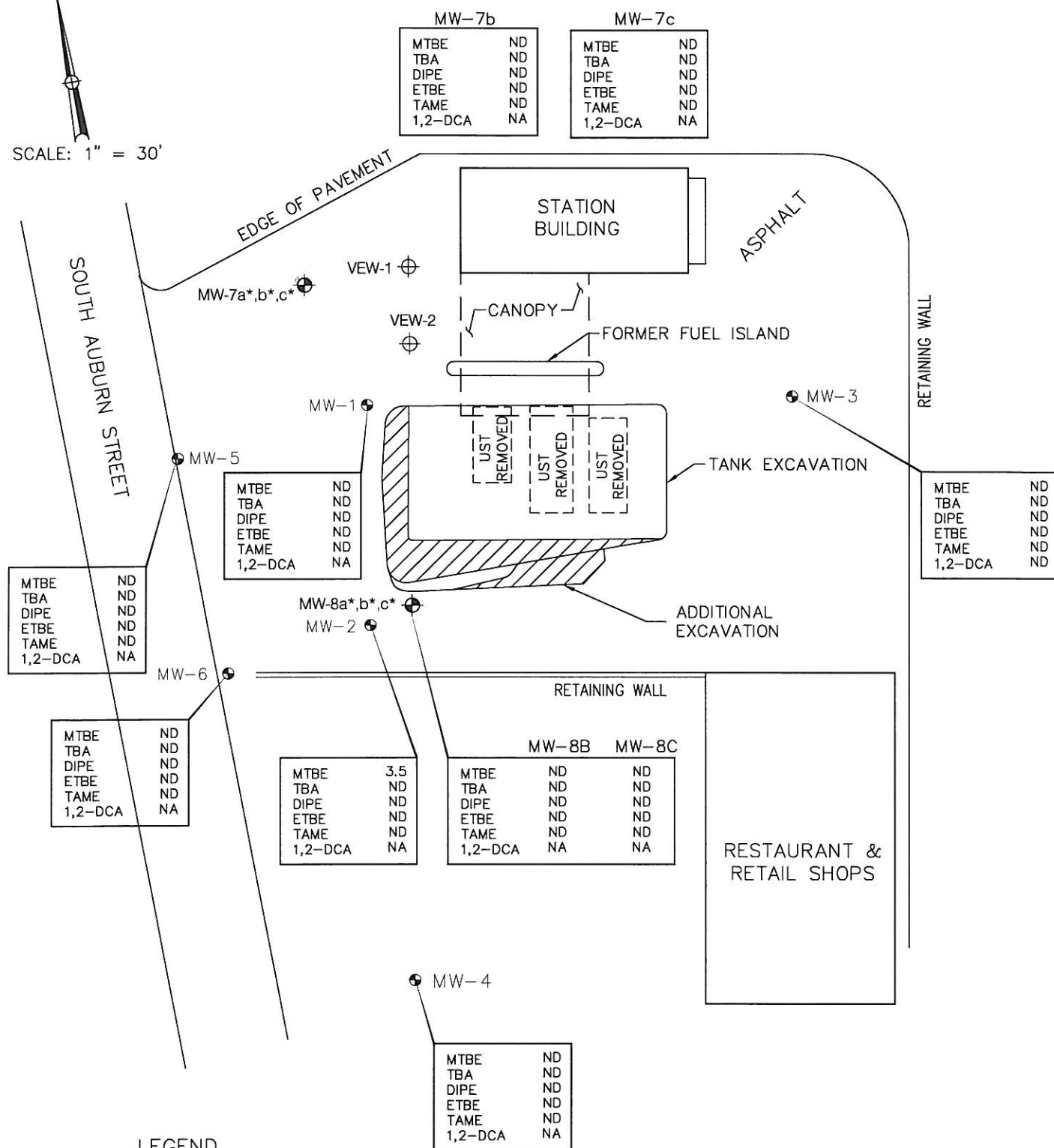
### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Failed HHRA – Soil Vapor. Note that failure of an HHRA based on subsurface vapor concentrations does not necessarily indicate that indoor quality is unacceptable, but further investigation is warranted



SCALE: 1" = 30'



### LEGEND

- MONITORING WELL LOCATION
  - ⊕ VAPOR EXTRACTION WELLS
  - ⊕ MULTIPLE COMPLETION MONITORING WELLS
- SAMPLED: APRIL 09, 2009

MTBE METHY-TERT-BUTYL-ETHER  
TBA TERTIARY BUTYL ALCOHOL  
DIPE DI-ISOPROPYL ETHER  
ETBE ETHYL TERTIARY BUTYL ETHER  
TAME TERTIARY AMYL MATHYL ETHER  
1,2-DCA 1,2-DICHLOROETHANE

COLFAX ARCO  
520 SOUTH AUBURN STREET  
COLFAX, CALIFORNIA  
OXYGENATES & 1,2-DCA  
IMPACTED GROUNDWATER DATA

**GHH**

ENGINEERING, INC.  
11960 Heritage Oak Place  
Auburn, CA 95603  
(530) 886-3100

INITIAL	JLG
DATE	5/15/2009
JOB #	4198
FIG. #	5



## Independent UST Case Closure Review

<b>Site Name</b>	Ken's Service Station
<b>Site Address</b>	13155 Lincoln Way Auburn, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	9204 (\$540,256)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	9,100	VW-1	Decreasing (v)
Benzene	1,500	MW-5	Decreasing (v)
MTBE	120	VW-1	Decreasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	No
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Quarterly Groundwater Monitoring
- No remediation completed at site to date.

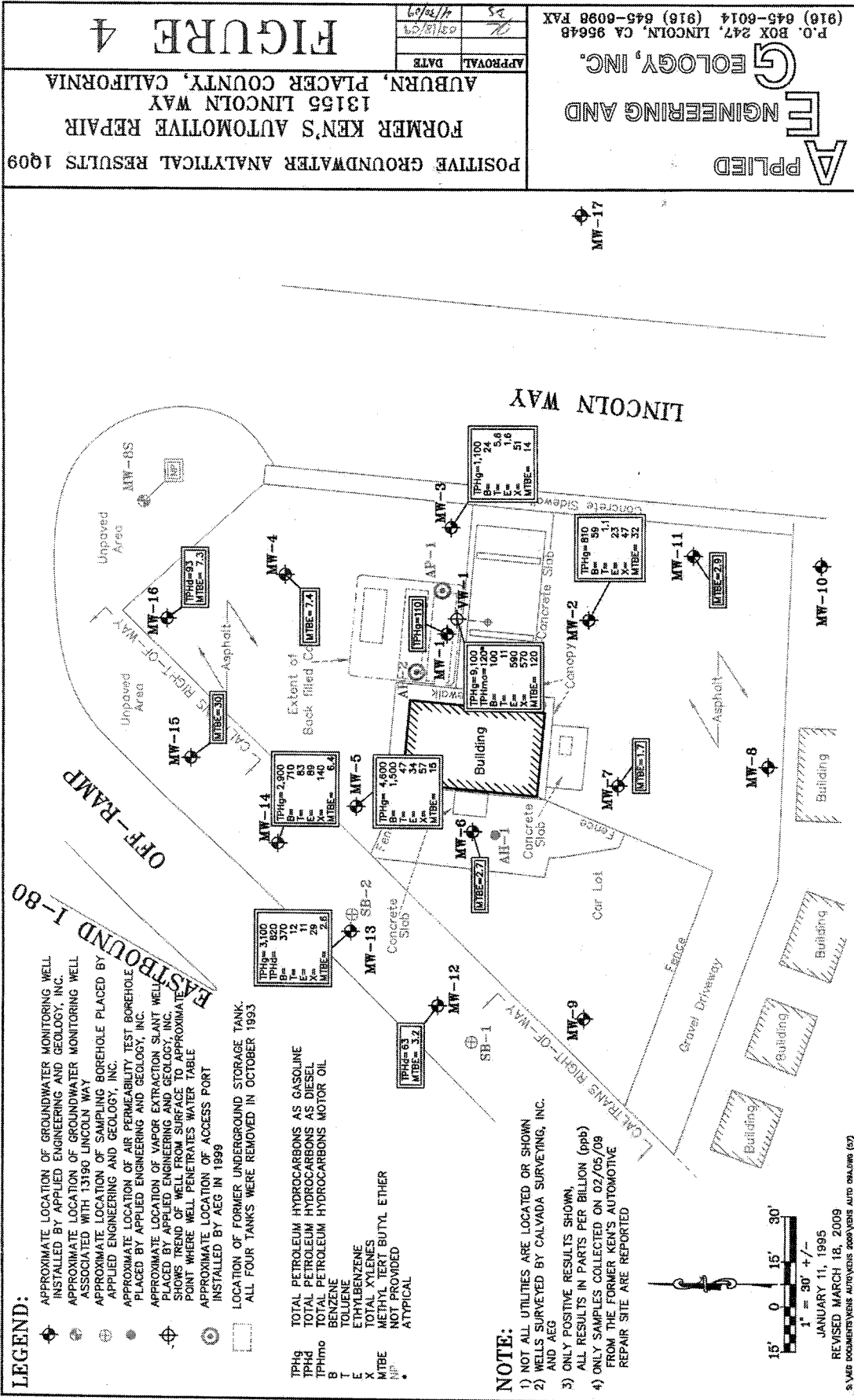
### Closure Evaluation

- Groundwater is at ~10-12' bgs
- Feasibility testing conducted indicated that SVE, GWE and Oxygen enhancement not feasible remedial options for site. Microbial tests indicate natural degradation as shown analytical testing and decreasing concentrations at site.
- HHRA done for site and indicated that carcinogenic risk for adult and child residential receptor unacceptable. Levels for workers also exceeded.
- Highest concentrations are in VW-1 located in under dispensers and cross gradient wells MW-5, MW-13 and MW-14.
- Plume undefined cross gradient into I80 off ramp, though lateral definition is probably unwarranted and infeasible. MTBE plume defined to site.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Failed HHRA – Soil Vapor. Note that failure of an HHRA based on subsurface vapor concentrations does not necessarily indicate that indoor quality is unacceptable, but further investigation is warranted



## Independent UST Case Closure Review

<b>Site Name</b>	Alright Parking Lot (Chevron Heritage #21-1315)
<b>Site Address</b>	4180 Wilshire Blvd Los Angeles, CA
<b>Lead Agency</b>	Los Angeles RWQCB
<b>USTCF Claim No.</b>	10278 (\$465,798)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	14,000	MW-8	No Trend (v)
Benzene	110	MW-9	Decreasing (v)
MTBE	ND<0.5	--	--
TBA	31	MW-18	No Trend (v)
DIPE	33	MW-18	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	Yes
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Quarterly and Semi-Annual Groundwater Monitoring
- Site is being redeveloped and some wells will be destroyed and replaced following site construction.
- SPH skimmers in two wells at site
- Remedial Action Plan will be implemented at site

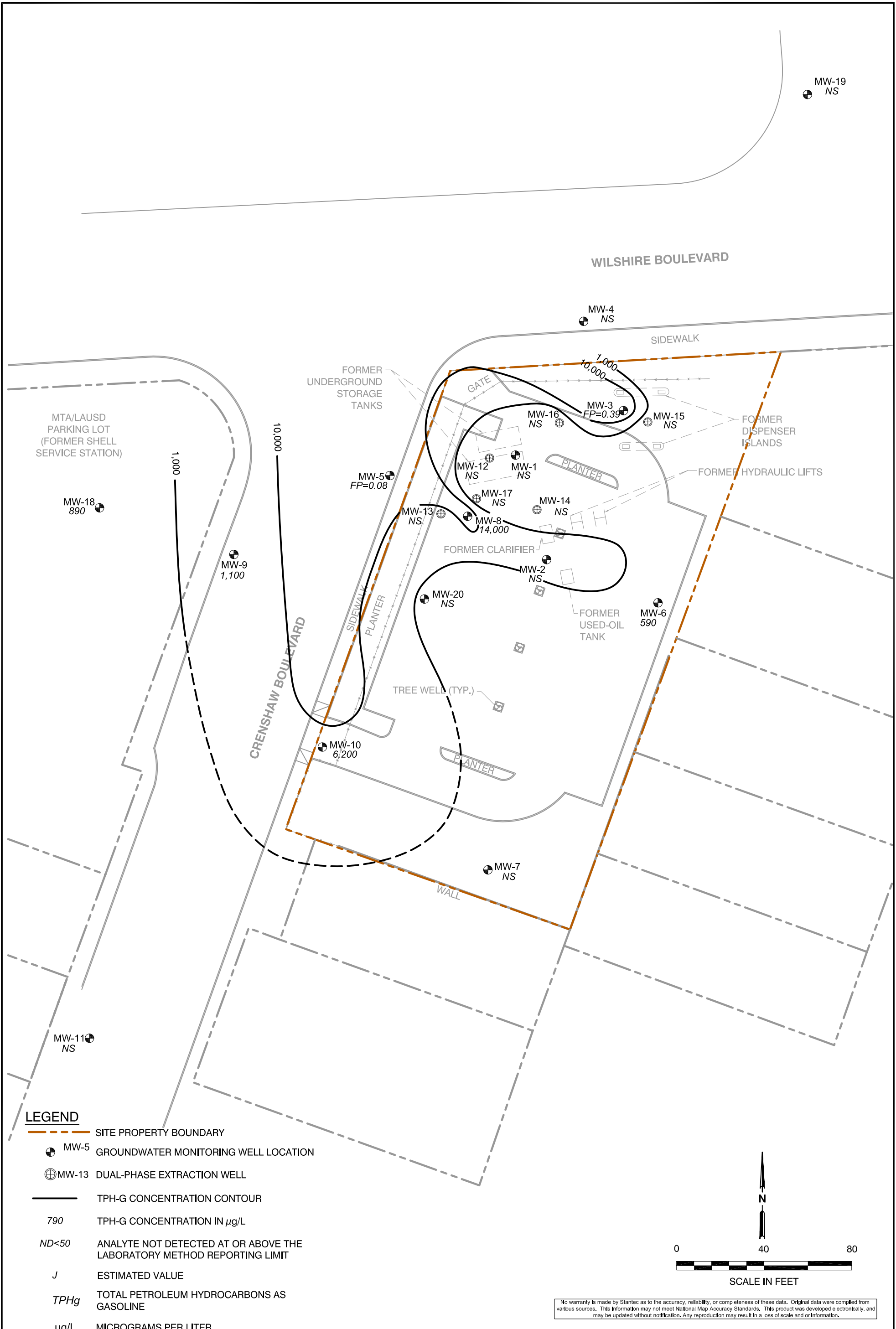
### Closure Evaluation


- Groundwater is at ~34' bgs
- SPH present in two wells at site (MW-3: 0.39', MW-5: 0.08')
- Residential properties crossgradient and upgradient.
- Additional off-site investigation warranted
- Additional remedial action proposed and appropriate.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: SPH present and not yet removed to extent practicable, site not adequately characterized



NS	NOT SAMPLED	 <b>Stantec</b> 3017 KILGORE ROAD, SUITE 100 RANCHO CORDOVA, CALIFORNIA PHONE: (916) 861-0400/861-0430 (FAX)	FOR: FORMER TIDEWATER SERVICE STATION CHEVRON SITE NO. 21-1315 4180 WILSHIRE BOULEVARD LOS ANGELES, CALIFORNIA		DISSOLVED PHASE TPH-G CONCENTRATIONS IN GROUNDWATER JUNE 4, 2009		FIGURE:  <b>4</b>
FP=0.08	NAPL THICKNESS IN FEET-NOT SAMPLED		JOB NUMBER: 211901030	DRAWN BY:  ARA	CHECKED BY:  MZ	APPROVED BY:  DR	DATE:  6/30/09

## Independent UST Case Closure Review

<b>Site Name</b>	Merced County Corporation Yard
<b>Site Address</b>	440 6 <sup>th</sup> Avenue Gustine, CA
<b>Lead Agency</b>	Merced County LOP
<b>USTCF Claim No.</b>	10596 (\$284,122)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	79,000	MW-18	Decreasing (v)
Benzene	6,600	MW-22	Decreasing (v)
MTBE	ND<0.5	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	1,000 ft

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	UNK
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	UNK
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- 4Q06 is most current groundwater sampling data available.
- Consultant proposing 98 air sparge wells(?)

#### Closure Evaluation

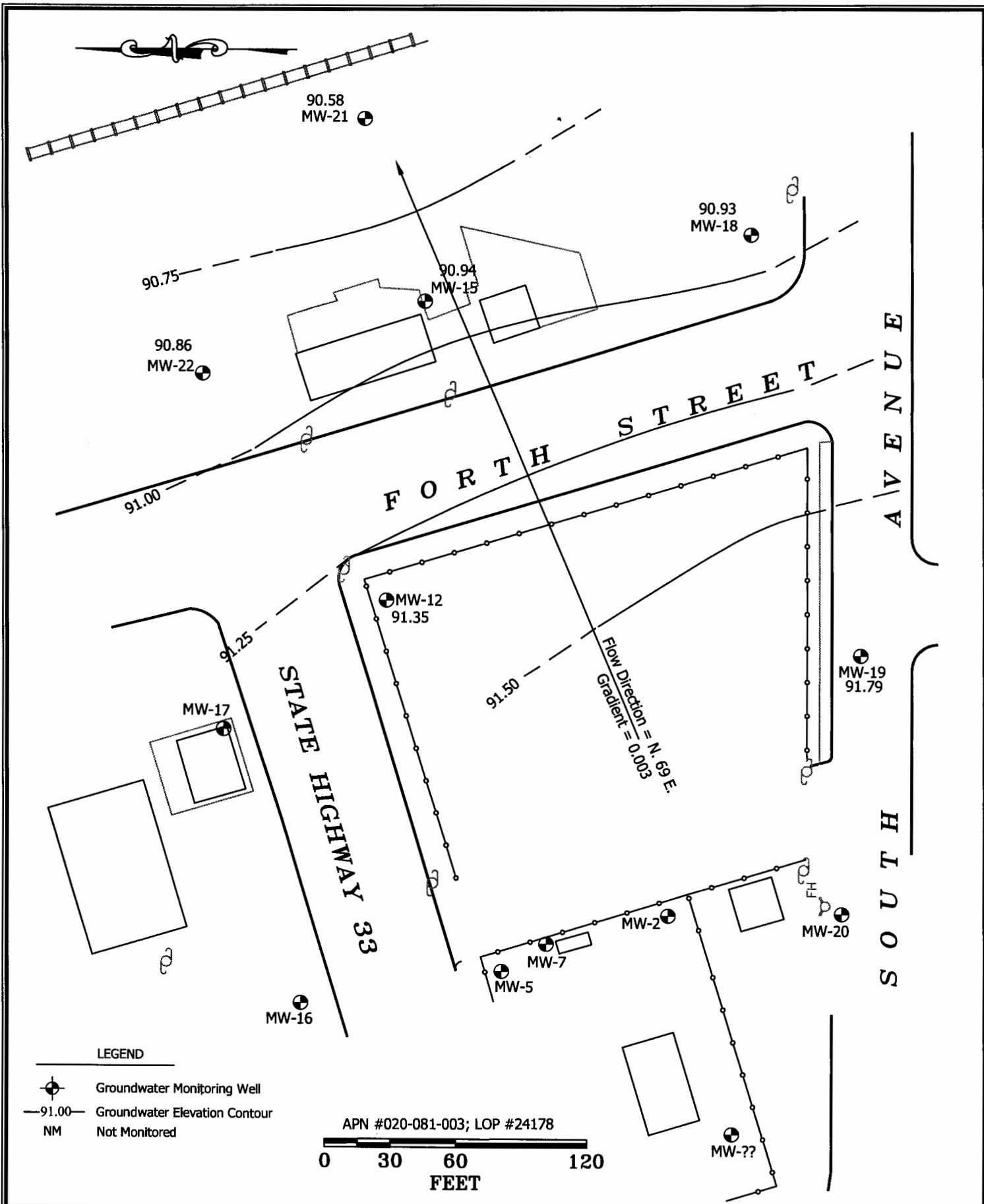
- Most recent groundwater data reports depth to water of ~7-9' bgs
- Municipal supply well located 50' from site, however this well is not used due to high nitrate concentration
- Current groundwater data has not been uploaded to GeoTracker. Remediation and natural processes could have changed the existing concentrations significantly in the past 3 years. Effective closure review is not possible without missing data.
- Vapor survey and HHRA do not indicate significant threat to human health.
- Very large, extensive plume with 50,000 ug/L benzene detected in groundwater from offsite soil boring.
- Subject site is not residential, however residential properties are nearby

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Full site characterization unavailable in GeoTracker; contaminant concentrations above low risk thresholds; unable to fully evaluate plume stability.





**HerSchy Environmental, Inc.**  
Environmental Consulting and Remediation

P. O. Box 229  
Bass Lake, California 93604-0229  
Tel. (559) 641-7320, Fax (559) 641-7340

**GROUNDWATER ELEVATION CONTOUR MAP**  
December 2006

Merced Co. Public Works Dept., Corporation Yard  
440 Sixth Street, Gustine, California

DATE:  
**JANUARY 2007**

FILE NO.:  
**A23-01**

DRAWN BY:  
**KAH**

FIGURE  
**2**

## Independent UST Case Closure Review

<b>Site Name</b>	Hollandia Dairy
<b>Site Address</b>	622 E Mission Road San Marcos, CA
<b>Lead Agency</b>	San Diego County LOP
<b>USTCF Claim No.</b>	12768, 13056 (\$153,914)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	1,700	MW-4	Decreasing (v)
Benzene	980	MW-4	Stable (v)
MTBE	4,600	MW-5	Decreasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	UNK
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

#### Closure Evaluation

- Groundwater is at ~4-6' bgs
- MTBE plume not defined to west (cross-gradient)
- Groundwater plume does not appear consistent with groundwater flow direction
- Groundwater sampling and corrective action is sporadic
- Sensitive receptor or well survey not available on GeoTracker. Unknown if performed.
- 2008 report indicates that CAP preparation is recommended.

#### Recommendation

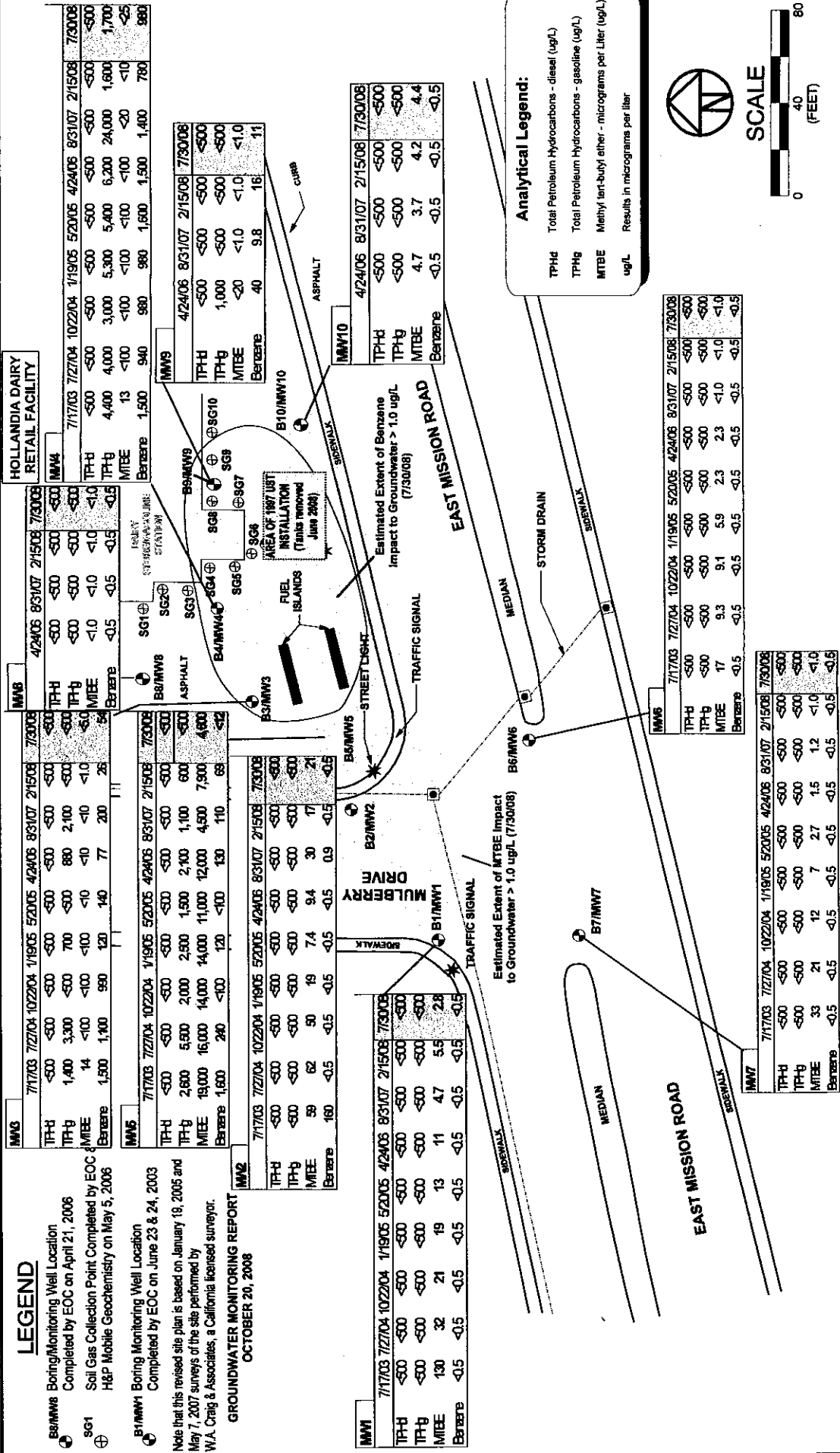
Closure not appropriate at this time. Warrants further regulation.

Reason: Site is not adequately characterized; concentrations exceed low risk criteria

# LEGEND

- B1/MW8 Boring/Monitoring Well Location  
Completed by EOC on April 21, 2006
  - SG1 Soil Gas Collection Point Completed by EOC  
H&P Mobile Geochemistry on May 5, 2006
  - B1/MW1 Boring/Monitoring Well Location  
Completed by EOC on June 23 & 24, 2003
- Note that this revised site plan is based on January 19, 2005 and May 7, 2007 surveys of the site performed by W.A. Craig & Associates, a California licensed surveyor.

## GROUNDWATER MONITORING REPORT OCTOBER 20, 2008



## Independent UST Case Closure Review

<b>Site Name</b>	Tom's Sierra Station #10
<b>Site Address</b>	890 Oro Dam Road Oroville, CA
<b>Lead Agency</b>	Central Valley RWQCB (5R)
<b>USTCF Claim No.</b>	12791 (\$182,364)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	3100	MW-10	Decreasing(v)
Benzene	64.7	MW-10	Decreasing(v)
MTBE	ND<0.5	--	Decreasing(v)
TBA	33.5	MW-10	Single Occurrence
TAME	2.28	MW-10	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Monthly Dual Phase Extraction Remediation Events

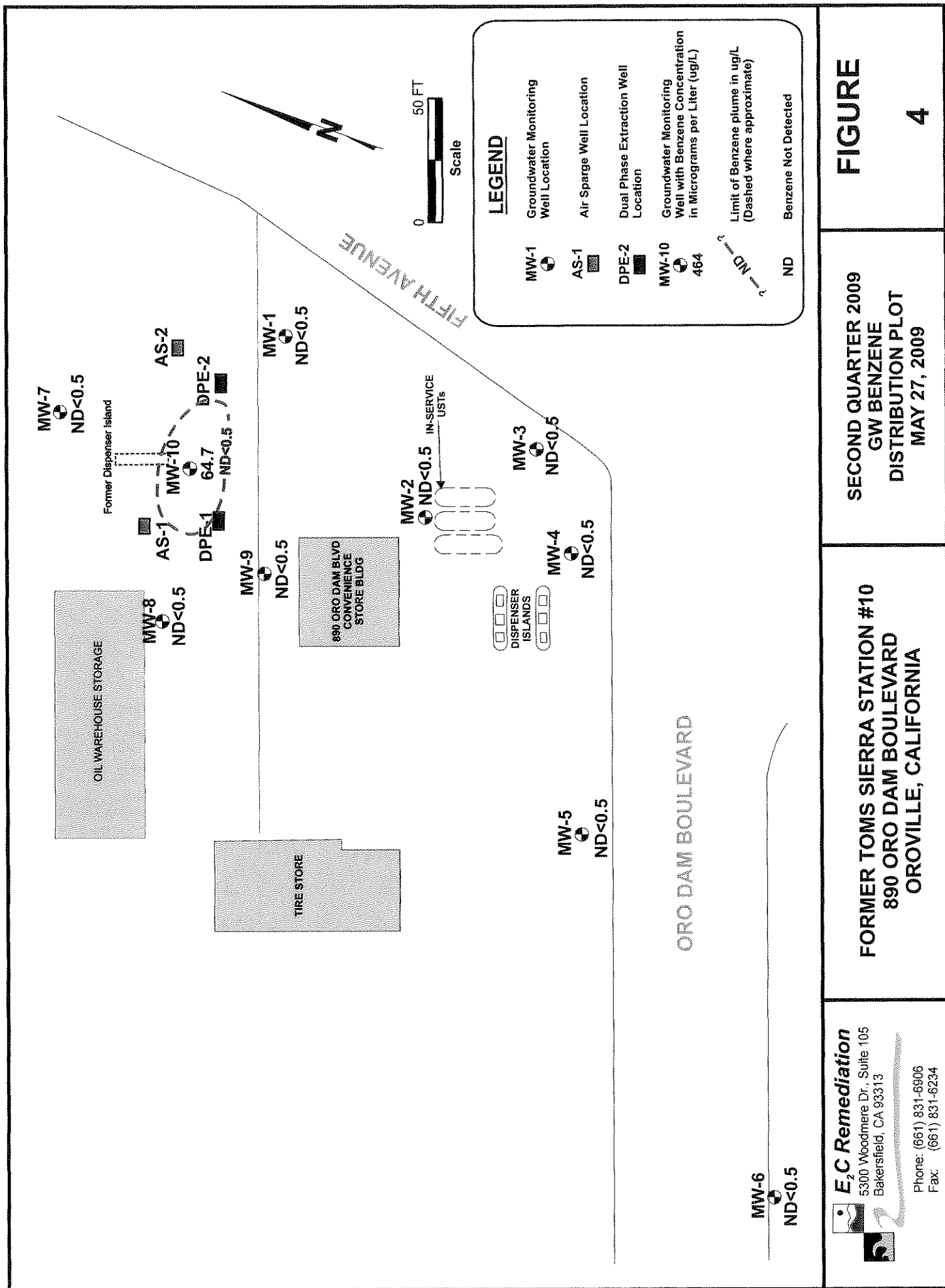
#### Closure Evaluation

- Groundwater is at ~10-12' bgs
- The contaminant plume appears to be highly localized – the only significantly impacted well is MW-10.
- The plume appears to be laterally defined in the downgradient direction. Contaminant detections in downgradient wells appear sporadically, and are not of a level that represent a significant threat to public safety or ecological receptors;
- Concentrations of residual constituents of concern are present above WQO's but do not appear to threaten current or probable beneficial uses. It is likely that the contaminants will degrade to WQO's before the resource will be used.
- High Vacuum Dual Phase Extraction events initiated in 2007 and continues to this day. Appears to be a mobile unit brought to the site, typically on a bi-weekly basis.
- High Vacuum Dual Phase Extraction has reportedly removed an estimated of 178 lbs of hydrocarbons to date.
- Further Active Remediation does not appear to be warranted at the current contaminant concentrations.
- It is unknown if Sensitive Receptor Survey has been performed, and as such, the distance to the nearest receptor is not known. Based on a review of GeoTracker, the consultant has not recommended the performance of an SRS, and the Agency has not directed an SRS to be performed. Because of this, it is assumed that the parties do not feel that one is warranted, and that it is not an impediment to closure.

#### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Concentrations of constituents of concern are low; Plume is decreasing and composed of low mobility constituents; Plume is highly localized; Continued monthly HVDPE is unwarranted – has removed only 178 lbs of hydrocarbon to date since 2007



## Independent UST Case Closure Review

<b>Site Name</b>	Seibert's Oil Co., Inc.
<b>Site Address</b>	2837 Parkway Drive N Fresno, CA
<b>Lead Agency</b>	Central Valley RWQCB (5F)
<b>USTCF Claim No.</b>	13747 (\$127,814)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	ND <50	--	--
TPHd	ND <50	--	--
Benzene	ND <1.0	--	--
MTBE	ND <1.0	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	>0.5 mi

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes



### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- CAP prepared – recommended Soil Vapor Extraction
- CAP approved. Installation of SVE system by January 2010

### Closure Evaluation

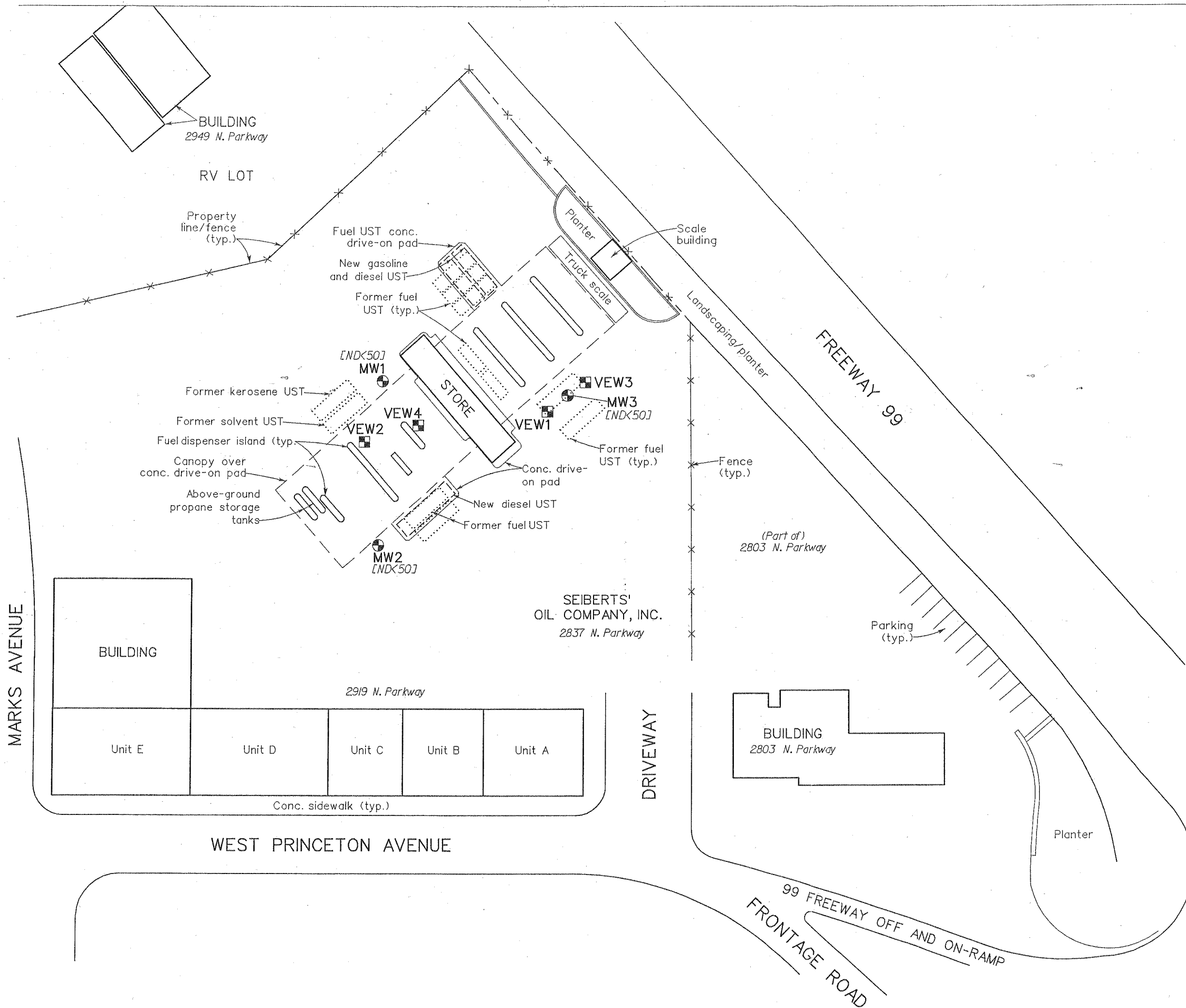
- Soil Only Case
- Groundwater is at ~103' bgs
- Releases appear to be associated with the tanks removed in 1998 and dispensers.
- SVE pilot test indicated ROI of 27 to 260 feet with flow rate of 35 to 140 scfm (vacuum of 12.5 to 25 ft H<sub>2</sub>O) with hydrocarbon removal rate of 0.02 and 0.83 lbs/hr. Max MTBE vapor concentration = 11 ppmv during pilot test.
- Maximum benzene concentration from vapor testing was 2.3 ppmv.
- Soils predominantly impacted by TPHd (Max 24,000 mg/kg). TPHg soil impact found (Max 3000 mg/kg). Minimal benzene (max 22 mg/kg). MTBE detected at a maximum of 300 mg/kg.
- A concentration of TPHd in soil decrease with depth with soil impact is predominantly in the 5 to 25 foot range.
- An estimated 4,812 gallons of diesel is reportedly present between 5 and 20 feet bgs.
- Active drinking water wells are not known to exist within the well search radius (0.5 mi.)
- The environmental record available on GeoTracker does not appear to indicate that a soil vapor study to evaluate potential impacts to indoor air quality has been performed. Since the regulator has not requested, and the consultant has not proposed to evaluate potential vapor impacts to indoor air quality, it is assumed that this is not a regulatory driver for this case.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Soils Only case; Impacts to groundwater possible, however nearest receptors are greater than ½ mile from the subject site.

Comment: A deed restriction may be placed on the property to protect against exposure to construction workers performing future subsurface activities.

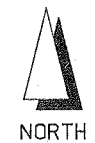


## EXPLANATION

- VIEW1 VAPOR EXTRACTION WELL LOCATION
- MW1 GROUNDWATER MONITORING WELL LOCATION
- NDK507 With TPH-G concentration in groundwater (in µg/l, on January 22, 2009; ND=not detected above laboratory detection limit)

### NOTES:

- 1) All allocations and dimensions are approximate.
- 2) Property and building outlines from drawing supplied by Seibert's Oil Company, Inc., and aerial photograph from Google Earth.
- 3) Groundwater monitoring, vapor extraction well locations, and site were surveyed by Robert Goodner Surveying, Inc. on April 5, 2007 and February 21, 2008.



0 60 120  
APPROXIMATE SCALE IN FEET

SEIBERT'S OIL COMPANY, INC.  
2837 N. PARKWAY DRIVE  
FRESNO, CALIFORNIA

Client: SEIBERTS' OIL COMPANY, INC. Project No.: 576-01

**FREY ENVIRONMENTAL, INC.**

**SITE SKETCH**  
SHOWING TPH-G CONCENTRATIONS  
IN GROUNDWATER ON JANUARY 22, 2009

Date: MARCH 2009

Figure 3

## Independent UST Case Closure Review

<b>Site Name</b>	Alta Sierra Gas
<b>Site Address</b>	10032 Alta Sierra Drive Grass Valley, CA
<b>Lead Agency</b>	Nevada County LOP
<b>USTCF Claim No.</b>	14238 (\$321,078)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	ND < 50	MW-1	No Trend (v)
Benzene	ND < 0.5	--	--
MTBE	143	MW-1	No Trend (v)
TBA	21.4	MW-1	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	450 ft downgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	No
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

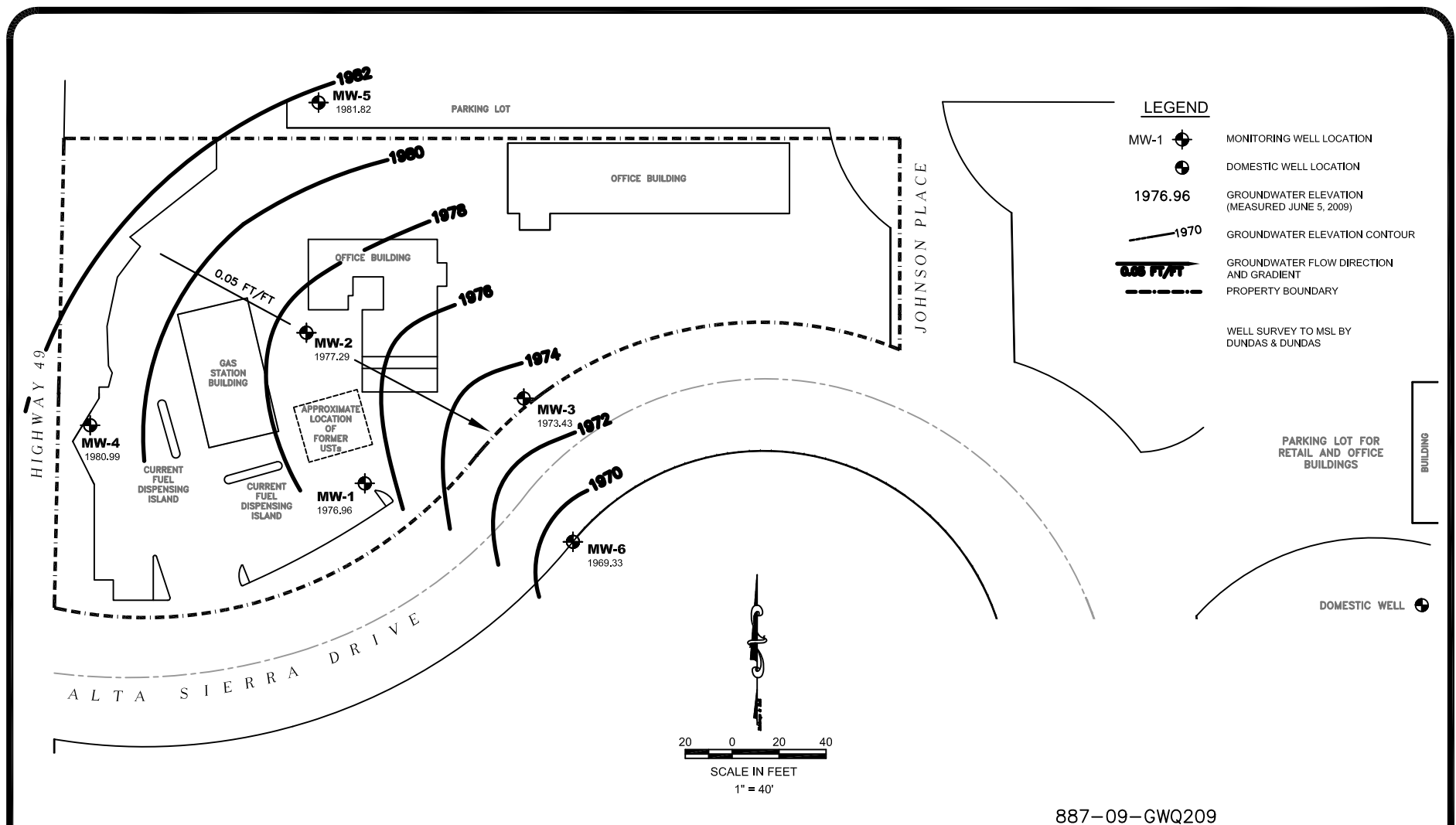
### Closure Evaluation

- Groundwater is at ~41' bgs
- Elevated MTBE and TBA onsite in MW-1. Concentrations in downgradient wells below MCL and decreasing trend observed.
- The contaminant plume appears to be highly localized at this time – the only significantly impacted well is MW-1. The plume appears to be laterally defined in the downgradient direction. Contaminant detections in downgradient wells are not of a level that represent a significant threat to public safety or ecological receptors;
- Domestic well is identified downgradient less than 500 feet from site. Wells in downgradient direction have been below MCLs for 5 years. Impact to domestic well is improbable.
- Soil Vapor survey indicated that benzene was present in soil vapor that exceeded health risk of 1.0E-6 under residential and commercial standards.
- Soil Vapor remediation would be necessary to decrease benzene risk prior to closure.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Failed HHRA – Soil Vapor. Note that failure of an HHRA based on subsurface vapor concentrations does not necessarily indicate that indoor quality is unacceptable, but further investigation is warranted



**HK HOLDREGE & KULL**  
CONSULTING ENGINEERS • GEOLOGISTS  
792 SEARLS AVENUE  
NEVADA CITY, CA 95959  
(530) 478-1306 FAX 478-1019

GROUNDWATER ELEVATION CONTOURS – JUNE 5, 2009  
ALTA SIERRA SERVICE STATION  
NEVADA COUNTY, CALIFORNIA

<b>DRAWN BY:</b> DFD	<b>CHECKED BY:</b> TJH
<b>PROJECT NO.:</b> 887-09	
<b>DATE:</b> JULY 2009	
<b>FIGURE NO.:</b> 2	

## Independent UST Case Closure Review

<b>Site Name</b>	Los Olivos Garage
<b>Site Address</b>	2900 Grand Avenue Los Olivos, CA
<b>Lead Agency</b>	Santa Barbara County LOP
<b>USTCF Claim No.</b>	15483 (\$236,970)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	ND <50	--	--
Benzene	0.64	MW-5	Decreasing(v)
MTBE	ND<0.5	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- High Vacuum DPE system shut down
- Verification investigation approved.

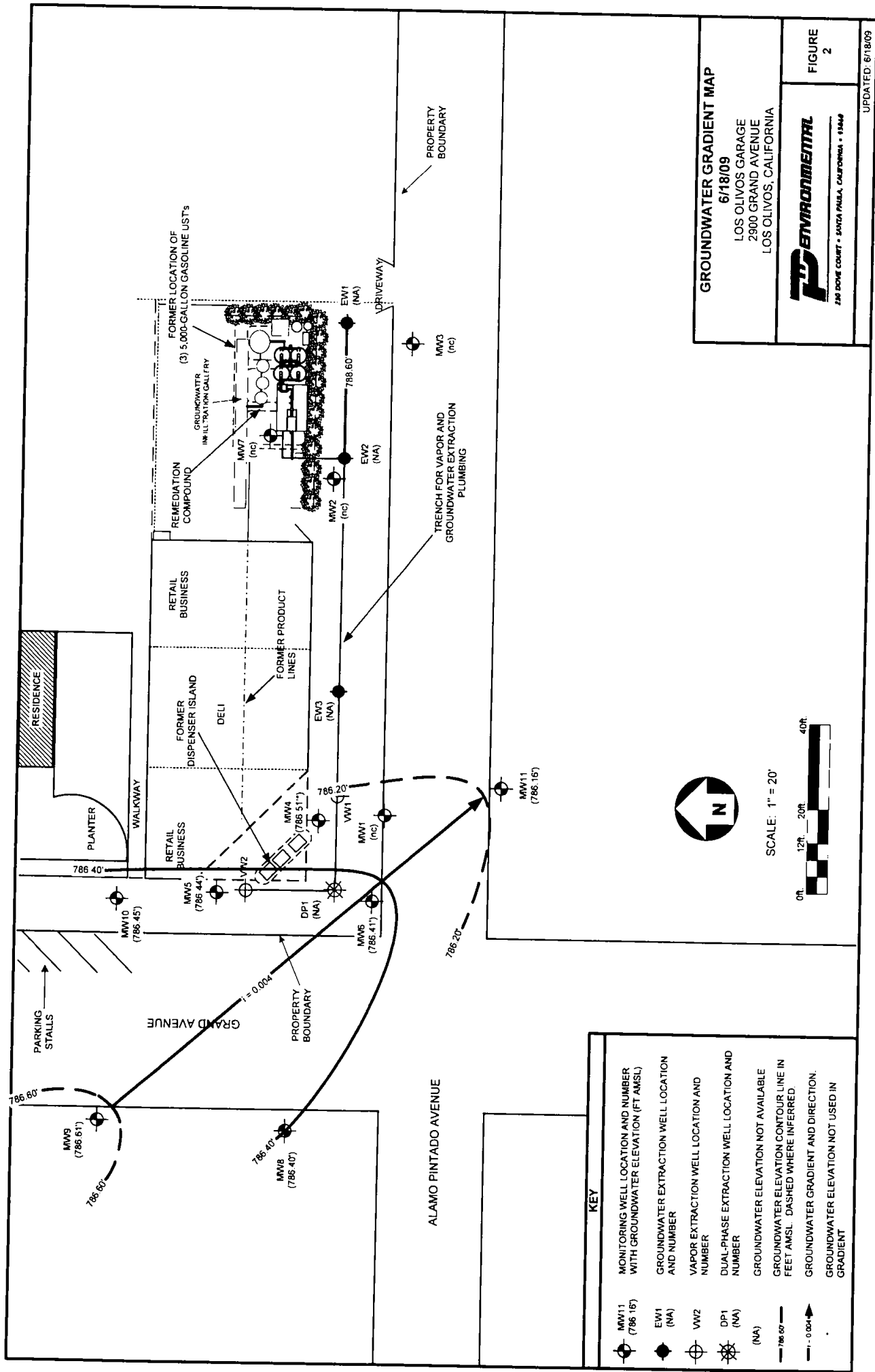
### Closure Evaluation

- Groundwater is at ~27' bgs
- High Vacuum Dual Phase Extraction has occurred from December 2008 to March 2009. Since that time, contaminant concentrations have decreased significantly.
- Groundwater is not impacted above MCLs. Approximately 550 pounds of petroleum hydrocarbons removed.
- It is unknown if Sensitive Receptor Survey has been performed, and as such, the distance to the nearest receptor is not known. Based on a review of GeoTracker, the consultant has not recommended the performance of an SRS, and the Agency has not directed an SRS to be performed. Because of this, it is assumed that the parties do not feel that one is warranted, and that it is not an impediment to closure.
- Further Active Remediation does not appear to be warranted at the current contaminant concentrations.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Water Quality Objectives appear to be met.





## Independent UST Case Closure Review

<b>Site Name</b>	Lost Nugget Market
<b>Site Address</b>	16448 Highway 49 Camptonville, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	16616 (\$385,943)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	4500	MW-5	Stable (v)
Benzene	3.9	MW-5	Stable (v)
MTBE	18	MW-5	Stable (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	340' upgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

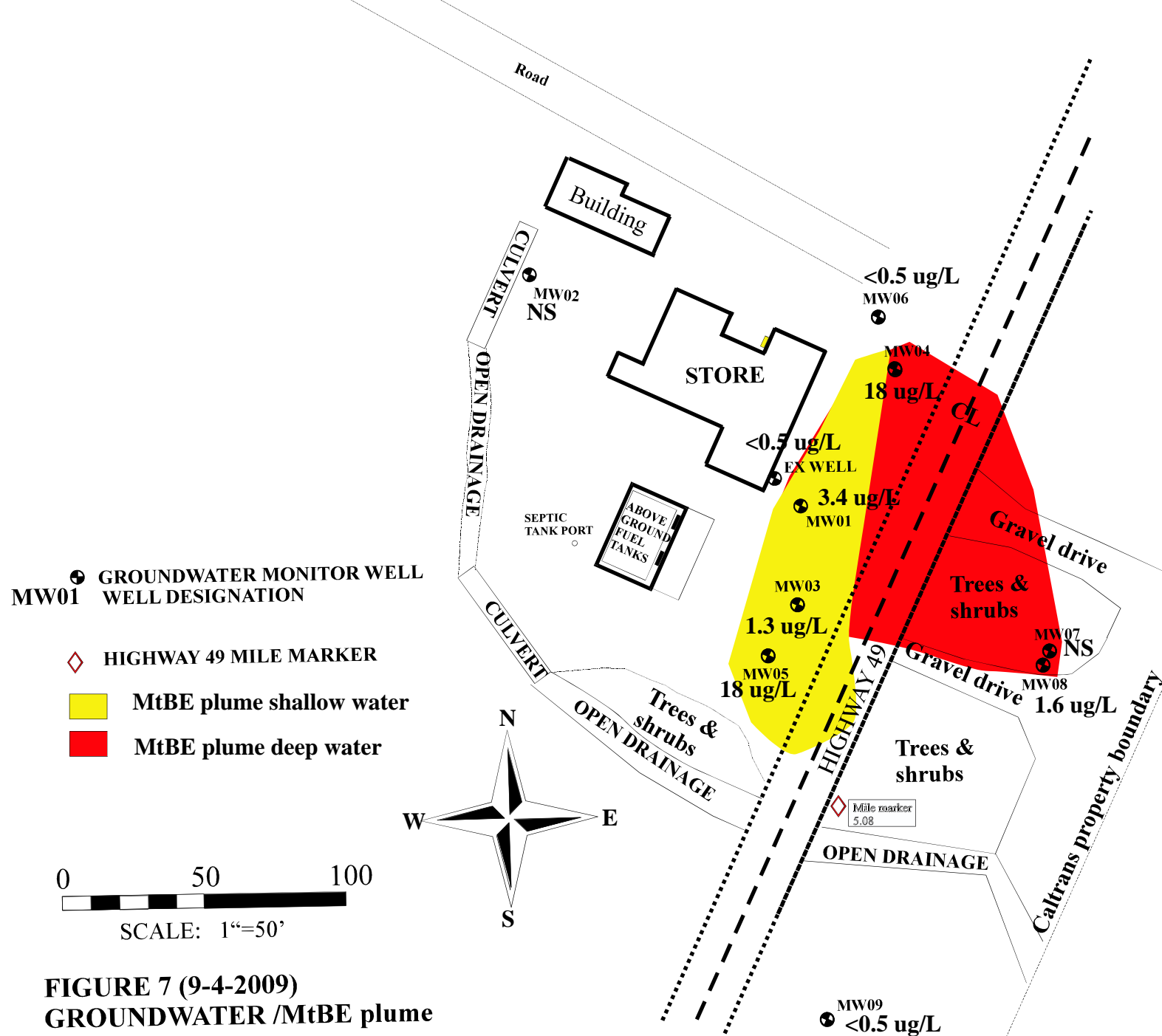
### Closure Evaluation

- Groundwater is at ~23' bgs
- Subsurface is fractured rock. Two groundwater gradients identified shallow and deep due to fractures. Both plumes defined.
- Community well located approximately 340 feet upgradient of site. Well is reportedly shallow: 95' total depth.
- Constituents of concern have not been detected in community well.
- Sampling of the community well was discontinued in June 2008 at the direction of Regional Board.
- The contaminant plume appears to be highly localized at this time – the only significantly impacted well is MW-5. The plume appears to be laterally defined in the downgradient direction.
- Concentrations of residual constituents of concern are present above WQO's but do not appear to threaten the existing domestic well. It is likely that the contaminants will degrade to WQO's before the resource will be used.
- Further Active Remediation does not appear to be warranted at the current contaminant concentrations.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Plume is highly localized; Contaminant concentrations are low; Community well is upgradient and not threatened



**FIGURE 7 (9-4-2009)**  
**GROUNDWATER /MtBE plume**

## Independent UST Case Closure Review

<b>Site Name</b>	John's Auto Repair
<b>Site Address</b>	3454 Santa Rosa Avenue Santa Rosa, CA
<b>Lead Agency</b>	Sonoma County LOP
<b>USTCF Claim No.</b>	1146 (\$845,410)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	18,000	MW-10	Decreasing (v)
<b>TPHd</b>	5,700	MW-10	Decreasing (v)
<b>Benzene</b>	2.5	MW-5	Decreasing (v)
<b>TBA</b>	22	MW-5	No Trend (v)
<b>MTBE</b>	ND <0.5	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	250' crossgradient 350' downgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	UNK
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	UNK
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Quarterly Groundwater Monitoring
- Ozone sparging since June 2005

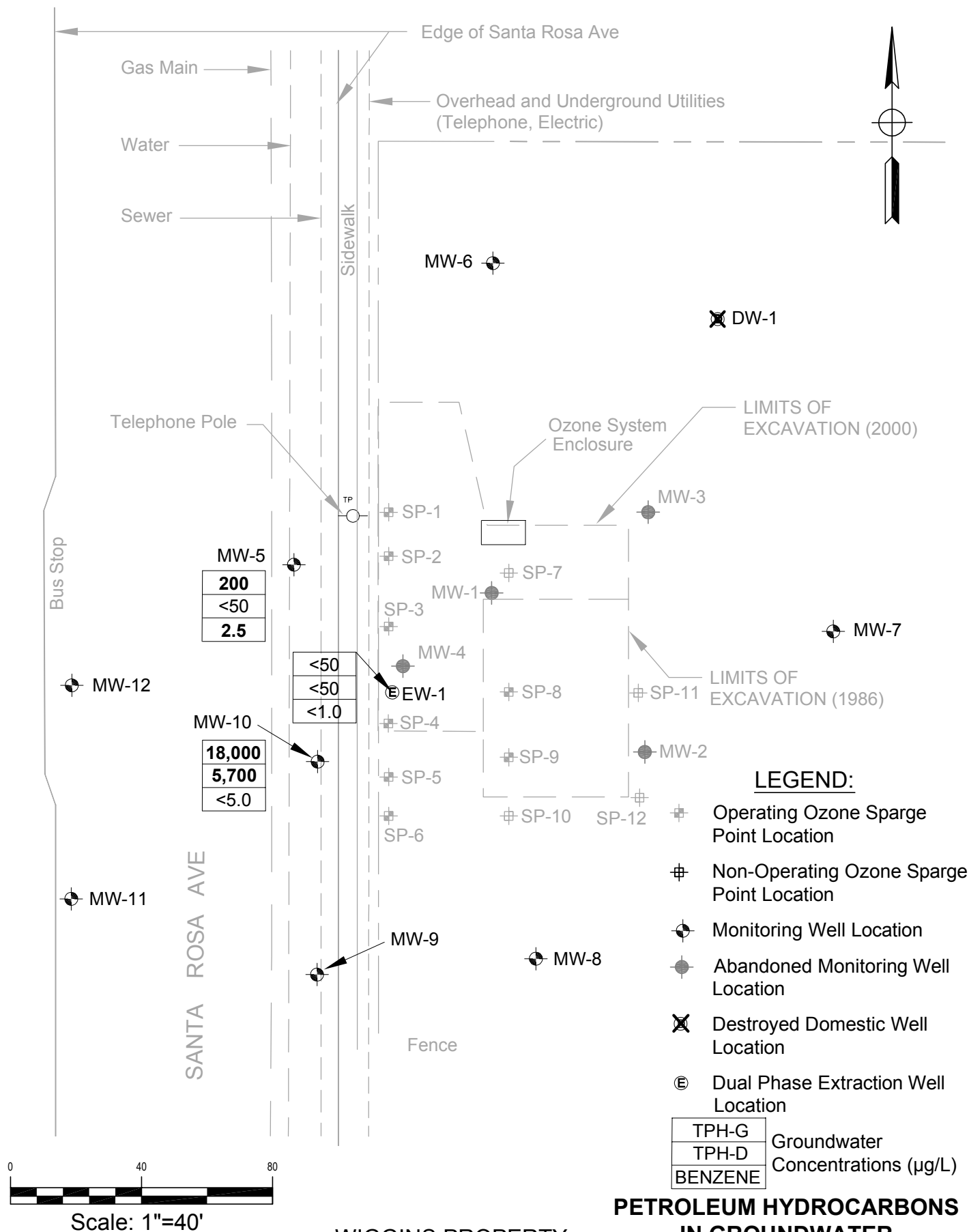
### Closure Evaluation

- Groundwater is at ~4' bgs
- Ozone sparging has occurred since June 2005. Since that time, contaminant concentrations have decreased significantly;
- Remaining constituents of concern are TPHg and TPHd in wells under road, downgradient of treatment system.
- Concentrations of TPHg and TPHd increase with groundwater elevation indicating soil impact remaining, however concentrations continue to decrease, either because of ozone sparging or natural attenuation
- TPH concentrations are high, though benzene, TBA and MTBE concentrations are very low.
- The contaminant plume appears to be highly localized at this time – the only significantly impacted well is MW-10. The plume appears to be laterally defined in the downgradient direction.
- Note that while TPHd was reported at 5,700 ug/L in 1Q09, during 4Q08, the TPHd concentration was 190,000 ug/L. This concentration may be indicative of the presence of free product.
- Domestic wells are located approximately 250' cross/up-gradient, and 350' downgradient of the most impacted well (MW-10).
- Wells MW-11 and MW-12 act as sentry wells to the downgradient domestic well. These wells have not shown any meaningful detection of contaminants since installed in 2002.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Though plume appears to be highly localized and composed of lower toxicity constituents, the probable presence of free product approximately 350' upgradient of a domestic well represents a potential threat to human health, even though there is no evidence that the plume is mobile. Contaminant concentrations must be reduced under the roadway or the downgradient well destroyed.



## Independent UST Case Closure Review

<b>Site Name</b>	Sacramento Executive Airport
<b>Site Address</b>	6151 Freeport Boulevard Sacramento, CA
<b>Lead Agency</b>	Central Valley RWQCB (5R)
<b>USTCF Claim No.</b>	1668, 1670 (\$652,808)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	12,000	MW-2	Decreasing (v)
Benzene	70	MW-2	Decreasing (v)
MTBE	ND<0.5	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- No site documents submitted for this site
- Air sparge/Vapor extraction conducted at site
- Closure requested in August & October 2005
- Additional assessment was conducted to confirm site conditions

### Closure Evaluation

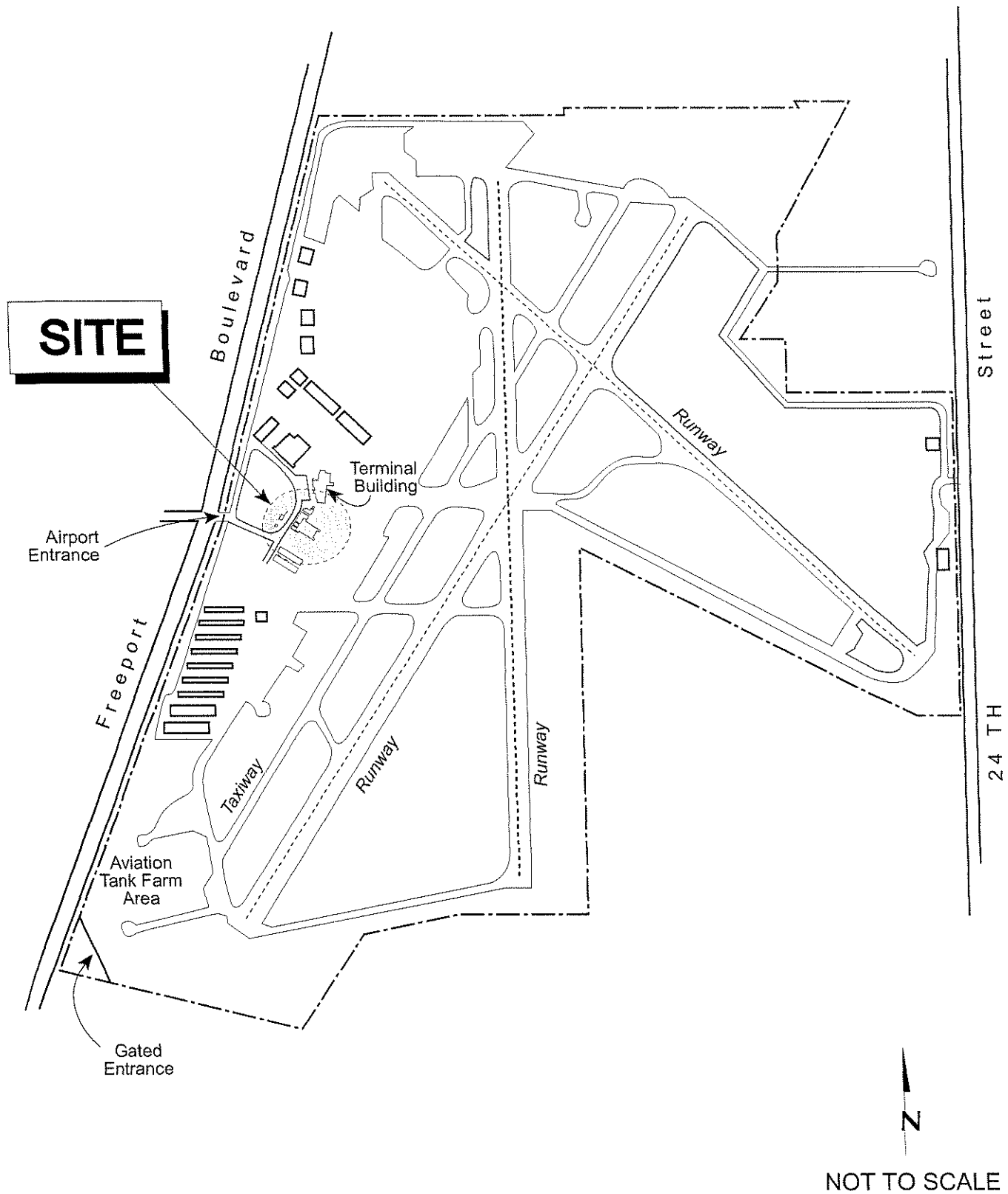
- Groundwater is at ~20' bgs
- Most recent groundwater data available is from November 2007.
- The contaminant plume appears to be highly localized at this time – the only significantly impacted well is MW-2. The plume appears to be laterally defined in the downgradient direction. Contaminant detections in downgradient wells appear sporadically, and are not of a level that represent a significant threat to public safety or ecological receptors;
- Plume migration and groundwater flow is toward airstrip and downgradient wells are non-detect for constituents of concern.
- It is unknown if Sensitive Receptor Survey has been performed, and as such, the distance to the nearest receptor is not known. Based on a review of GeoTracker, the consultant has not recommended the performance of an SRS, and the Agency has not directed an SRS to be performed. Because of this, it is assumed that the parties do not feel that one is warranted, and that it is not an impediment to closure.
- Concentrations of residual constituents of concern are present above WQO's but do not appear to threaten current or probable beneficial uses. It is likely that the contaminants will degrade to WQO's before the resource will be used.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Concentrations are low, Groundwater flow direction is toward airstrip.





Reference: County of Sacramento, Executive Airport



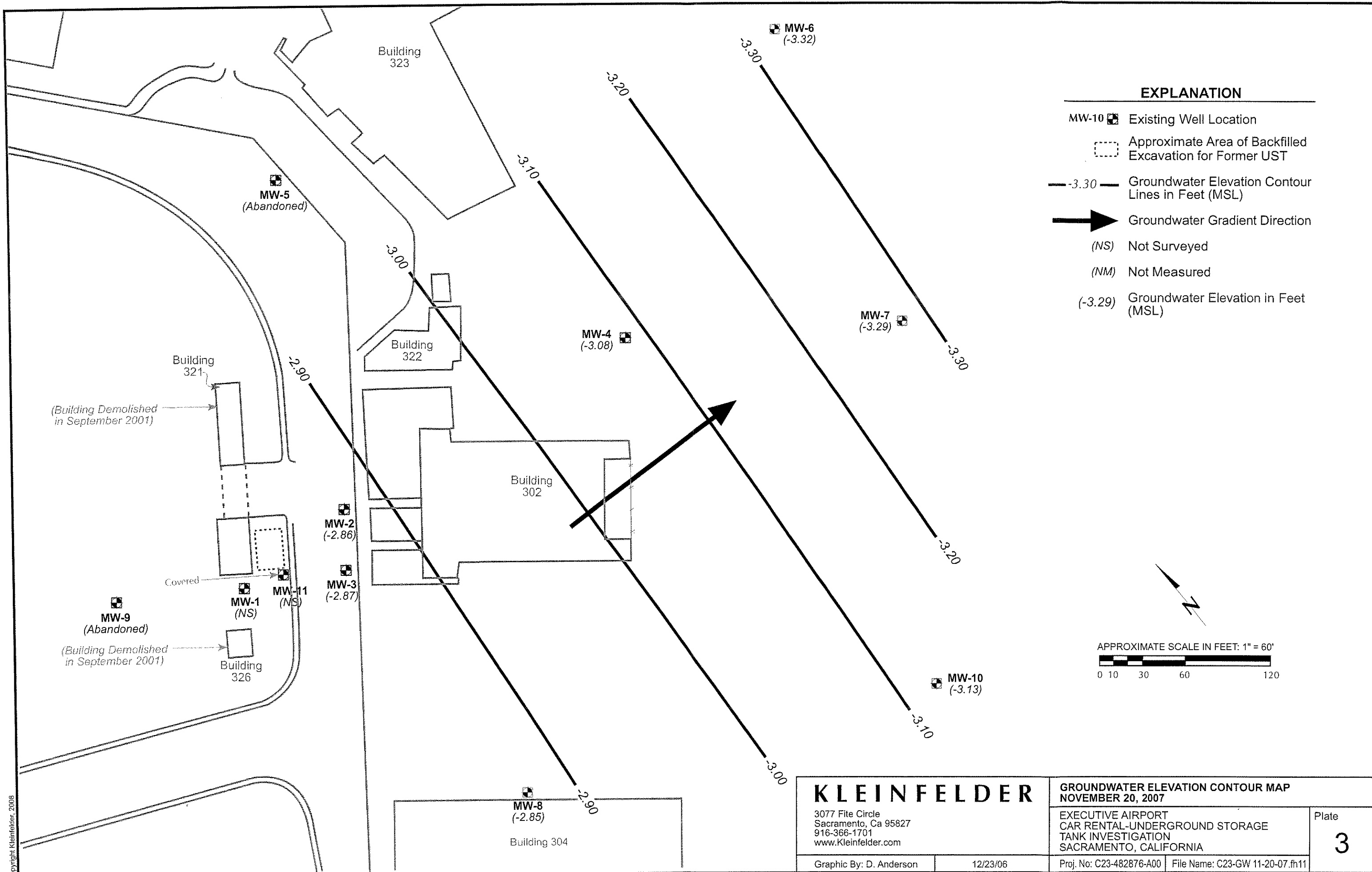
**AREA MAP**  
 EXECUTIVE AIRPORT  
 CAR RENTAL-UNDERGROUND STORAGE  
 TANK INVESTIGATION  
 SACRAMENTO, CALIFORNIA

PLATE

2

Drawn By: M. Bussanich  
 Project No. 23-482876-A00

Date: 5-20-2004  
 Filename: 3039b.fh10



<b>KLEINFELDER</b>		<b>GROUNDWATER ELEVATION CONTOUR MAP</b>	
3077 Fite Circle Sacramento, Ca 95827 916-366-1701 www.Kleinfelder.com		NOVEMBER 20, 2007	
EXECUTIVE AIRPORT CAR RENTAL-UNDERGROUND STORAGE TANK INVESTIGATION SACRAMENTO, CALIFORNIA		Proj. No: C23-482876-A00	File Name: C23-GW 11-20-07.fh11
Graphic By: D. Anderson		12/23/06	Plate <b>3</b>

## Independent UST Case Closure Review

<b>Site Name</b>	Thrifty Oil #123
<b>Site Address</b>	434 5 <sup>th</sup> Avenue Escondido, CA
<b>Lead Agency</b>	San Diego County LOP
<b>USTCF Claim No.</b>	2118 (\$418,115)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	13,300	MW-8	Increasing (v)
Benzene	26	MW-3	Decreasing (v)
MTBE	21,200	MW-8	Increasing (v)
DIPE	116	MW-3	Increasing (v)
TBA	569	MW-8	Increasing (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- SVE & GWT since November 2008

#### Closure Evaluation

- Groundwater is at ~5-7' bgs
- SVE & GWT implemented at site.
- Contaminant plume currently defined, however increasing concentrations in MW-8 may indicate that plume is not stable and has migration potential.
- Contaminants from neighboring property has impacted subject site. Site has been recommended to the commingled plume account.

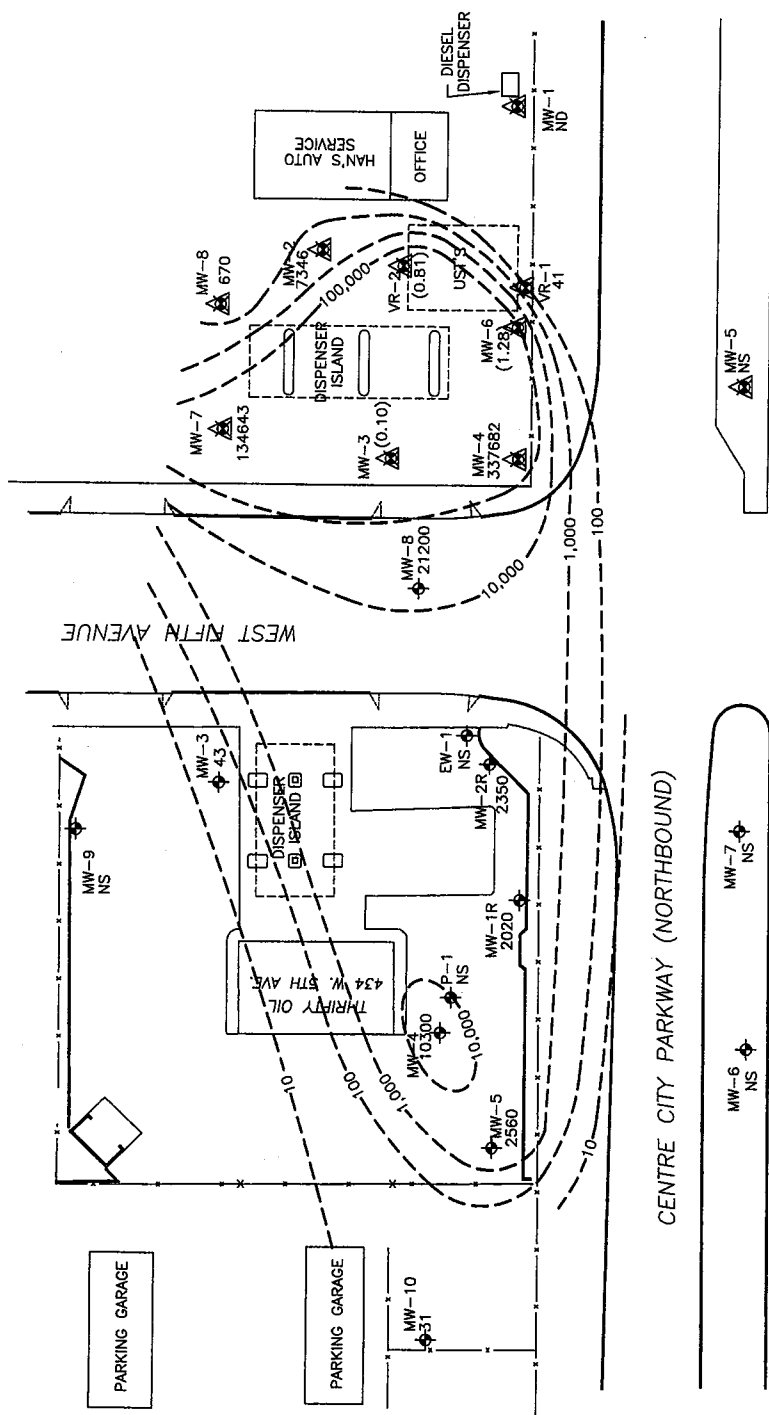
#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Contaminant concentrations in excess of low risk criteria; Contaminant concentrations are increasing, possibly indicating that plume is migrating.

# LEGEND

- THRIFTY GROUNDWATER MONITORING WELL SHOWING MTBE CONCENTRATION IN ug/L
- HAN'S GROUNDWATER MONITORING WELL SHOWING MTBE CONCENTRATION IN ug/L
- LINE OF EQUAL MTBE CONCENTRATION
- NOTES:  
 ND - NOT DETECTED  
 NA - DATA NOT AVAILABLE  
 NS - NOT SAMPLED



DATE DRAWN	MTBE ISOCONCENTRATION MAP	FIGURE NO.
REV. DATE	SEPTEMBER 29, 2009	5
CAD FILE	FORMER THRIFTY SERVICE STATION #123	PROJECT NO.
07251MTB	434 W. 5th AVE.	07.251
	ESCONDIDO, CA	

## Independent UST Case Closure Review

<b>Site Name</b>	Exxon #7-9134 (Coronado Texaco)
<b>Site Address</b>	1102 Hollister Street San Diego, CA
<b>Lead Agency</b>	San Diego County LOP
<b>USTCF Claim No.</b>	12559, 5435 (\$111,042)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	170,000	MW-10	No Trend (v)
<b>Benzene</b>	29,000	MW-10	No Trend (v)
<b>MTBE</b>	3,300	MW-10	No Trend (v)
<b>TBA</b>	ND <2500	--	--
<b>TAME</b>	ND <500	--	--

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	UNK
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Free product skimming at site.

#### Closure Evaluation

- Groundwater is at ~16' bgs
- Though free product has not been observed since October 2007, TPHg concentrations are considered consistent with the presence of free product.
- Human Health Risk Assessment and Sensitive Receptor Survey not available on GeoTracker – unknown if performed
- Site part of large commingled plume.
- Plume appears to be stable and extent is defined at this time
- Mobile home park (residential) is located downgradient of site

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Concentrations in excess of low risk criteria; Free product likely present





## Independent UST Case Closure Review

<b>Site Name</b>	Mobil Oil No 11-KLC
<b>Site Address</b>	402 Mission St W Santa Barbara, CA
<b>Lead Agency</b>	Santa Barbara County
<b>USTCF Claim No.</b>	5510 (\$647,431)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	14,000	MW04R	Decreasing(v)
Benzene	1,600	MW04R	Decreasing(v)
MTBE	2,900	MW04R	Decreasing(v)
TBA	3,900	MW04R	Decreasing(v)

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	700'

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Quarterly Groundwater Monitoring
- Oxygen diffusion since 2004

#### Closure Evaluation

- Groundwater is at ~23-26' bgs
- Contaminants appear to be localized in vicinity of MW04R and MW09
- Concentrations of MTBE and TBA high – 2,900 ug/l and 3,900 ug/l, respectively
- Site is located in a residential area
- Current remedial approach (passive remediation through oxygen diffusion) may not be adequate for mitigation of MTBE and TBA

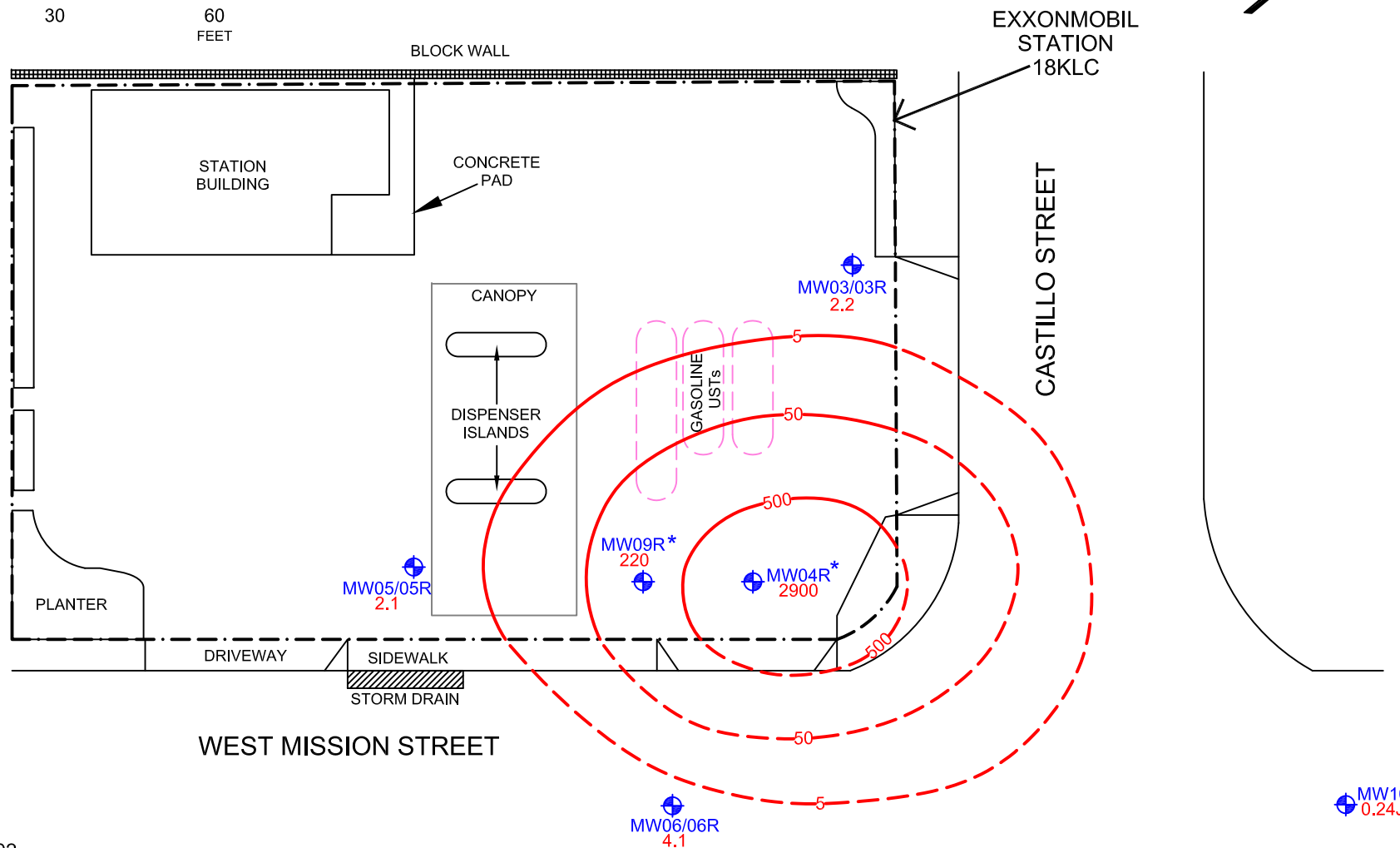
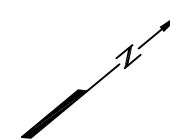
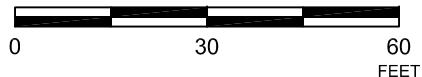
#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Concentrations in excess of low risk criteria

SOURCE:  
Modified from a map  
provided by  
HOLGUIN, FAHAN & ASSOCIATES, INC.

APPROXIMATE SCALE



FN 10430002



# **MTBE GROUNDWATER ISOPLETH CONCENTRATION MAP - 02/13/09**

EXXONMOBIL STATION 18KLC  
402 West Mission Street  
Santa Barbara, California

## **EXPLANATION**

- + MW10 Groundwater monitoring well
- \* Emitter well
- MTBE concentration in micrograms per liter
- J Estimated value between method detection limit and practical quantitation limit
- Line of equal MTBE concentration (dashed where inferred)

**PROJECT NO.**

1043

**PLATE**

6

DATE: 06/08/09

## Independent UST Case Closure Review

<b>Site Name</b>	Mobil #04-GPE
<b>Site Address</b>	229 E St Marysville, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	5749 (\$1,366,661)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	35,000	MW-6	No Trend (v)
Benzene	2,000	PV7	Decreasing (v)
MTBE	72	EW2	Decreasing (v)
TBA	17	EW2	Decreasing (v)
1,2-DCA	7.9	AW7	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	Yes
Distance to Nearest Receptor	>2000'

Low Risk Evaluation Criteria	
Free Product Present at Site?	Yes
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Quarterly Groundwater Monitoring
- SVE ongoing
- DPE Pilot Test performed
- Recommended implementation of DPE or combined GWE/SVE

#### Closure Evaluation

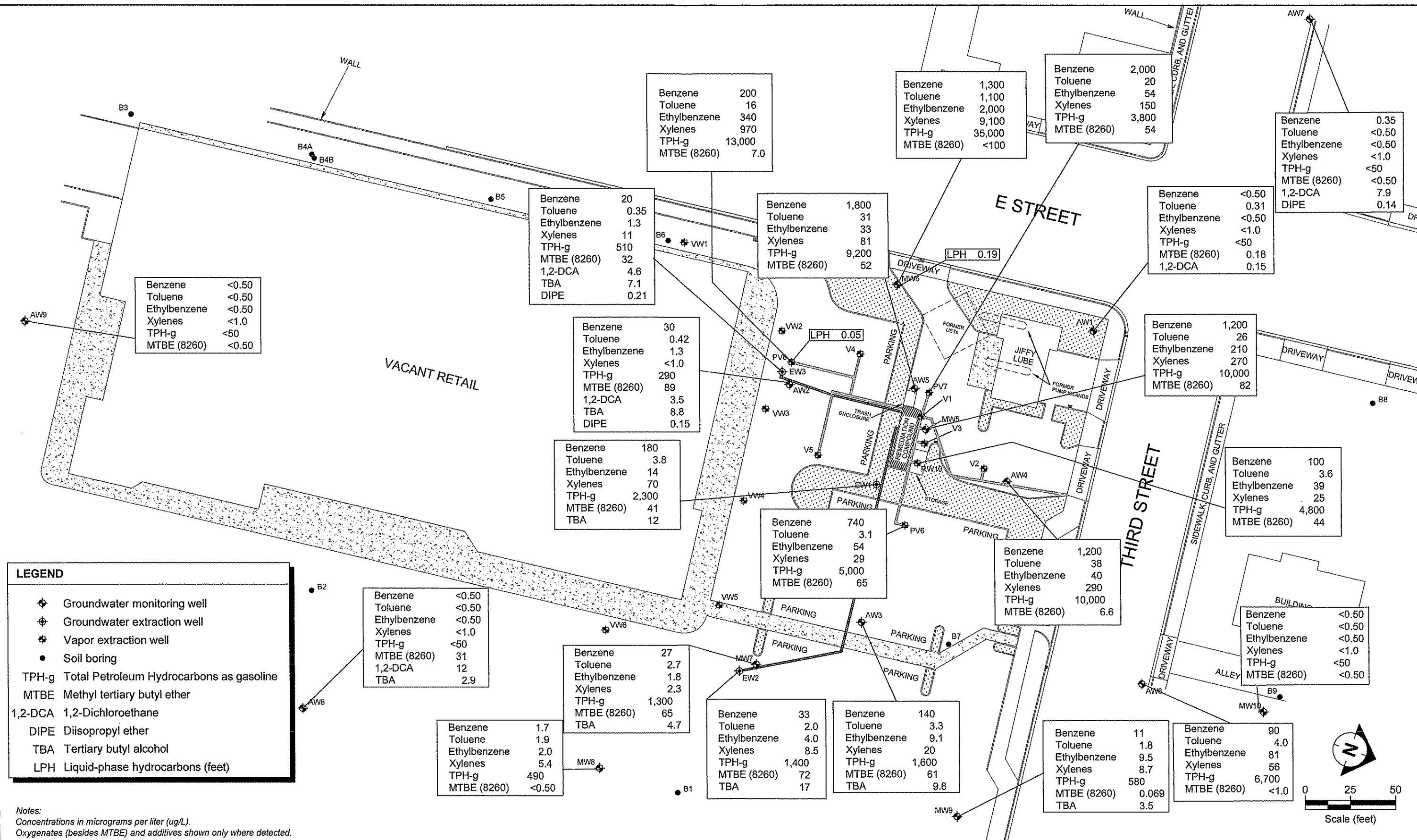
- Groundwater is at ~23' bgs
- SPH present up to 0.19' in two wells (MW-6 and PV8)
- High concentrations, up to 2,000 ug/l, of Benzene present
- Recent site assessment completes plume lateral delineation, though some wells are submerged (including SPH well MW-6)
- Groundwater concentrations have been decreasing or stable since SVE operation.
- Nearby properties are residential (downgradient)

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Free product present in site wells; concentrations in excess of low risk criteria

FILENAME: 2a2009.dwg 05/31/09



SITE MAP SHOWING GROUNDWATER ANALYTICAL RESULTS  
FORMER MOBIL STATION 04GPE  
229 E STREET, MARYSVILLE, CALIFORNIA  
11 MAY 2009

FIGURE:

2

## Independent UST Case Closure Review

<b>Site Name</b>	Rapid Gas #51
<b>Site Address</b>	909 Pacific Coast Hwy W Harbor City, CA
<b>Lead Agency</b>	Los Angeles RWQCB (4)
<b>USTCF Claim No.</b>	7795 (\$508,346)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	5,200	MW-1	Decreasing(v)
<b>Benzene</b>	1,400	MW-3	Decreasing(v)
<b>MTBE</b>	1,100	MW-3	No Trend(v)
<b>TBA</b>	8,900	MW-1	No Trend(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	2,370 crossgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- SVE/AS ongoing

### Closure Evaluation

- Groundwater is at ~35-40' bgs
- Concentrations of mobile compounds MTBE (1,100 ug/l) and TBA (8,900 ug/l) above low-risk criteria
- Benzene, MTBE and TBA off-site under residential properties
- TBA not defined downgradient.
- Groundwater flow predominately to the west.
- Municipal well located approximately 2,370 feet southwest of site.
- Lake in proximity of site but not considered receptor due to lake depth at 7 feet bgs and groundwater impact at 35-40 feet bgs.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Plume underlies residential properties downgradient of site; Concentrations present in excess of low-risk criteria; Plume not fully defined

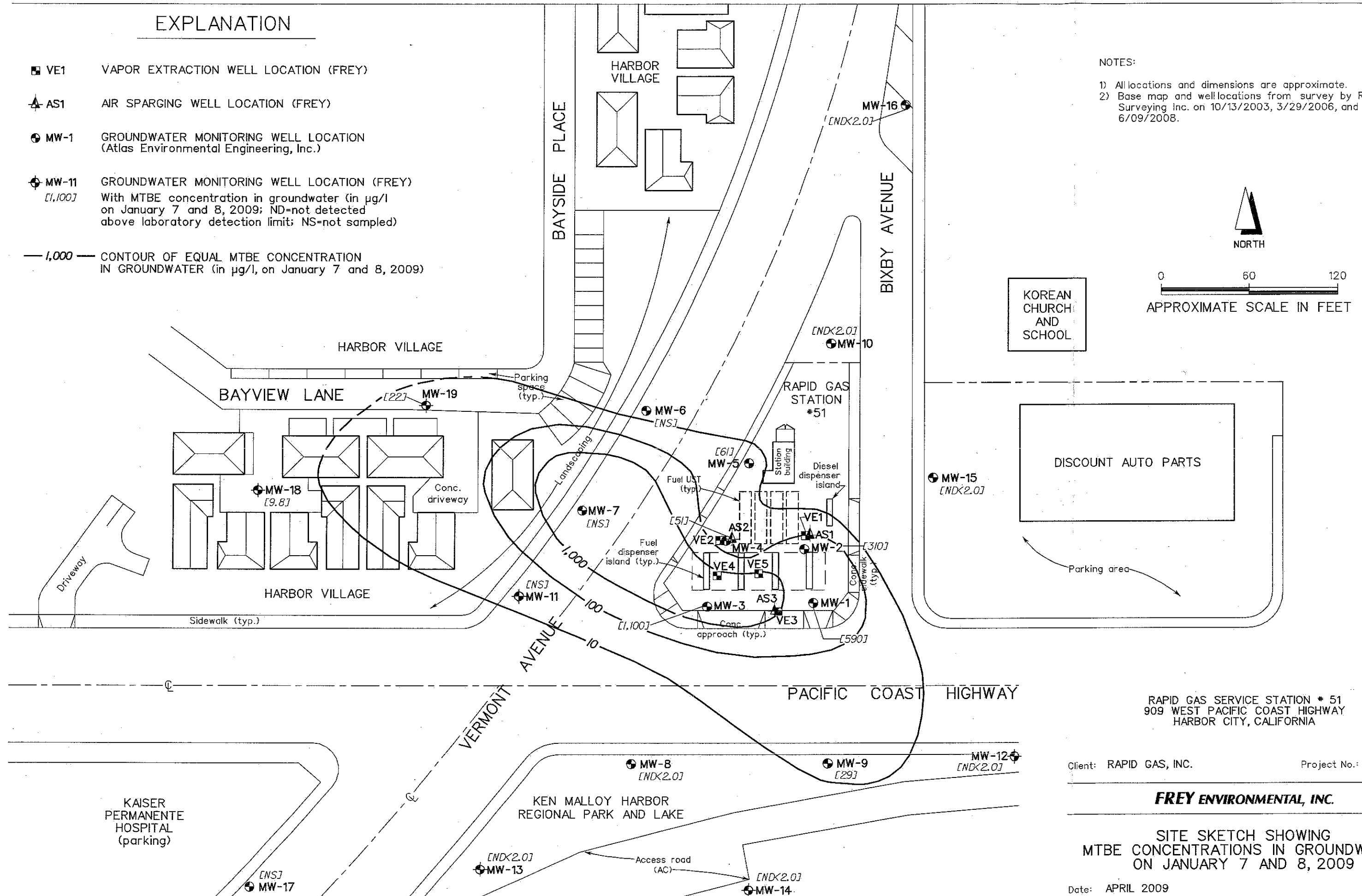


# EXPLANATION

- VE1 VAPOR EXTRACTION WELL LOCATION (FREY)
- ▲ AS1 AIR SPARGING WELL LOCATION (FREY)
- MW-1 GROUNDWATER MONITORING WELL LOCATION (Atlas Environmental Engineering, Inc.)
- MW-11 GROUNDWATER MONITORING WELL LOCATION (FREY)  
[1,100] With MTBE concentration in groundwater (in µg/l on January 7 and 8, 2009; ND=not detected above laboratory detection limit; NS=not sampled)
- 1,000 — CONTOUR OF EQUAL MTBE CONCENTRATION IN GROUNDWATER (in µg/l, on January 7 and 8, 2009)

## NOTES:

- 1) All locations and dimensions are approximate.
- 2) Base map and well locations from survey by RdM Surveying Inc. on 10/13/2003, 3/29/2006, and 6/09/2008.



## Independent UST Case Closure Review

<b>Site Name</b>	D&D Wholesale Tires
<b>Site Address</b>	409 Hwy 12 W Rio Vista, CA 94571
<b>Lead Agency</b>	Solano County
<b>USTCF Claim No.</b>	9979 (\$376,750)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	14,000	MW4	No Trend (v)
Benzene	2,300	MW4	No Trend (v)
Xylenes	350	MW4	No Trend (v)
MTBE	180	MW2	No Trend (v)
TBA	360	MW2	No Trend (v)
1,2-DCA	1.2	MW2	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	1,000'

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Pilot Study Work Plan required by April 20, 2009 (late)
- Active Remediation required by September 21, 2009 (late)

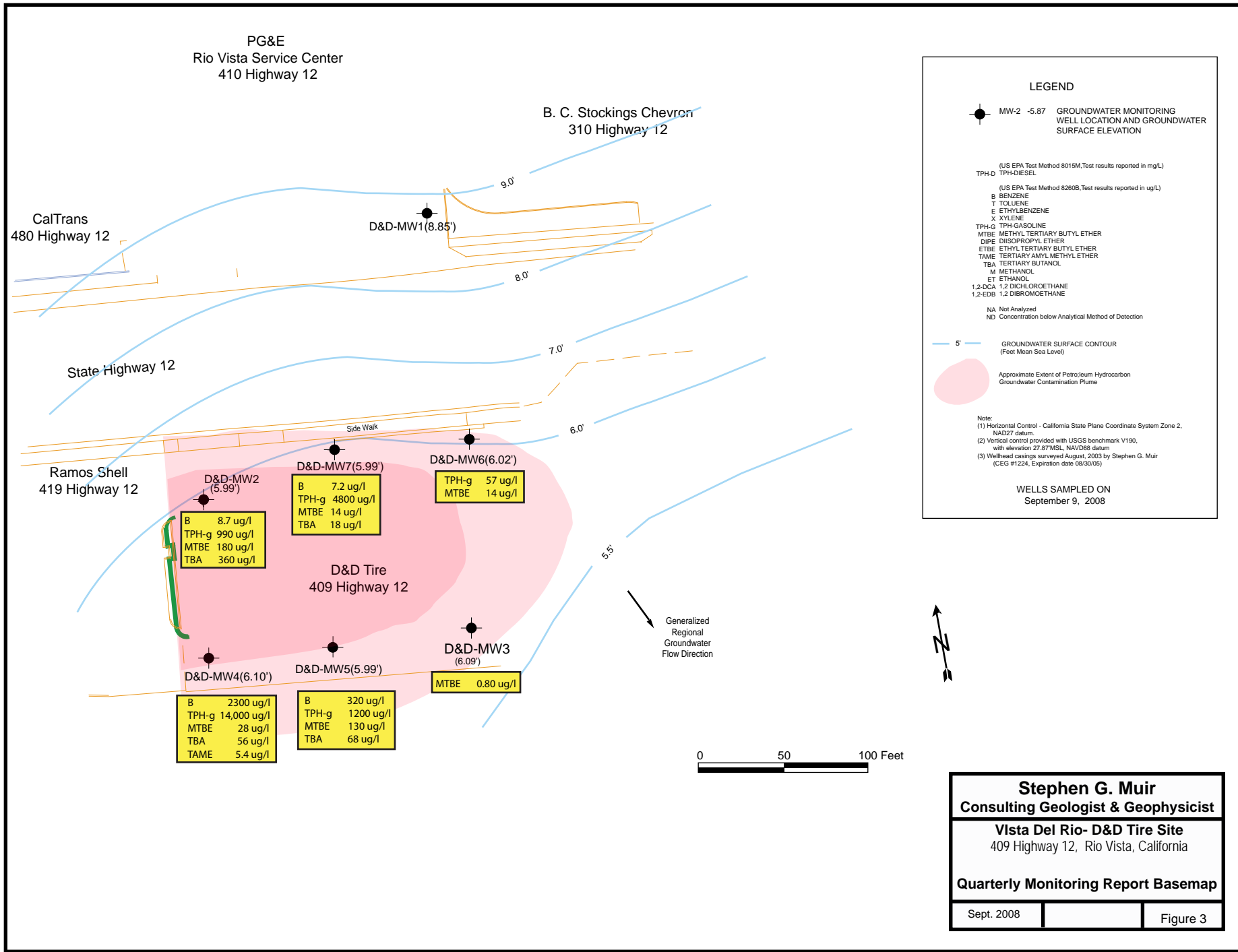
#### Closure Evaluation

- Groundwater is at ~14' bgs
- Impact not defined in any direction
- Contaminant concentrations do not exhibit a clear trend
- Contribution from offsite sources very likely... not currently evaluated (as far as can be determined with available data)
- Residential properties adjacent to site (downgradient)
- Pilot Study and active remediation required by regulator

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reasons: Inadequate characterization; Contaminant concentrations in excess of low-risk criteria; Residential properties adjacent to site in downgradient direction; Plume likely off-site in downgradient direction.



## Independent UST Case Closure Review

<b>Site Name</b>	S.F. Oakland Truck Stop
<b>Site Address</b>	8255 San Leandro St Oakland, CA
<b>Lead Agency</b>	Alameda County LOP
<b>USTCF Claim No.</b>	12240 (\$779,511)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	1,500	MW-2	Decreasing(v)
TPHd	960	MW-2	Decreasing(v)
TPHmo	2,500	MW-2	Single Occurrence(v)
Benzene	1.5	MW-2	Decreasing(v)
MTBE	64	MW-2	Decreasing(v)
TBA	5,000	MW-5	Increasing(v)

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	Adjacent to Site (Creek)

Low Risk Evaluation Criteria	
Free Product Present at Site?	Yes
Plume Stable and Not Migrating?	UNK
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	UNK
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	UNK

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring

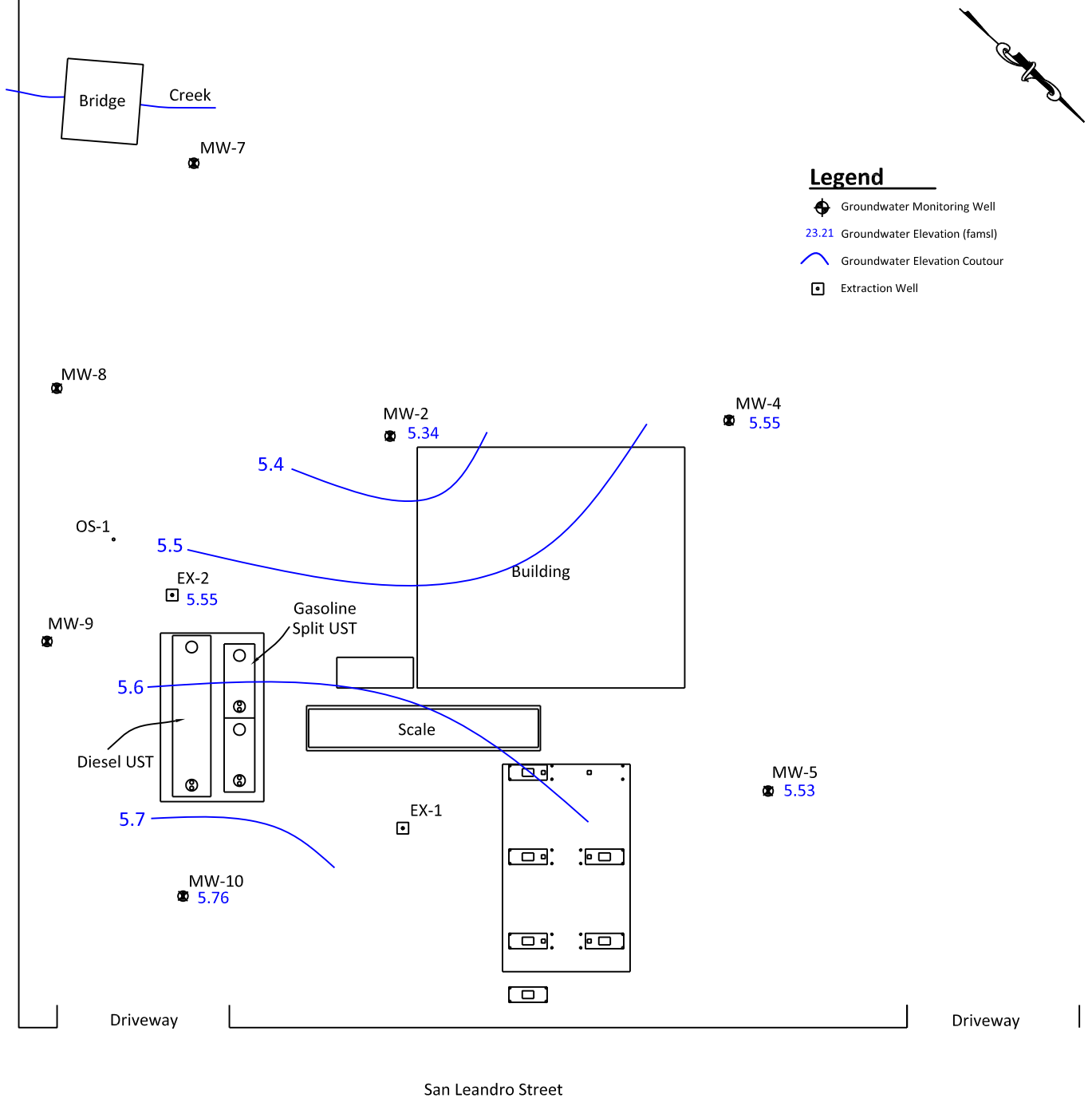
### Closure Evaluation

- Groundwater is at ~5' bgs
- Plume defined to ND levels downgradient.
- TBA increasing.
- SPH reported in one well (MW-2) at a thickness of 0.005'. SPH had been previously reported in well MW-1 at 1.16' before abandonment in July 08. MW-1 had contained up to 6.13' in December 2005.
- SPH removal is not currently occurring, and no attempt to remove product to extent practicable is known to have been made.
- An unnamed creek is adjacent to the site in the downgradient direction. Well placement unable to adequately evaluate whether discharges to surface water is occurring.
- One industrial and two irrigation wells are known to exist within a 2,000' radius of the site. No domestic or municipal supply wells are known to exist within a 2000' radius of the site.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reasons: Free product present at site and not yet removed to extent practicable; Site adjacent to unnamed creek; TBA concentrations increasing; Inadequate characterization to evaluate potential discharges to creek adjacent to site.



## Site Groundwater Gradient 12/30/2008



321 Court Street  
Woodland, California 95695  
(530) 406-1760

Lic. No. 909563

Fax# (530) 406-1760

**Oakland Truck Stop**  
**8255 San Leandro Street**  
**Oakland, California**



Project #: 6019  
Date: 02/15/2009  
Scale: 1" = 40'

Figure:

**4**

## Independent UST Case Closure Review

<b>Site Name</b>	United Oil #14
<b>Site Address</b>	2500 Magnolia St Burbank, CA
<b>Lead Agency</b>	Los Angeles RWQCB (4)
<b>USTCF Claim No.</b>	12477 (\$254,464)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	5,900	MW-11	Stable (v)
<b>TPHd</b>	5,500	MW-7	No Trend (v)
<b>Benzene</b>	9.4	MW-6	Decreasing (v)
<b>MTBE</b>	25,000	MW-11	Increasing (v)
<b>TBA</b>	7,700	MW-7	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	Yes
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes



#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Ongoing AS/SVE system
- Weekly SPH removal
- Offsite Assessment planned

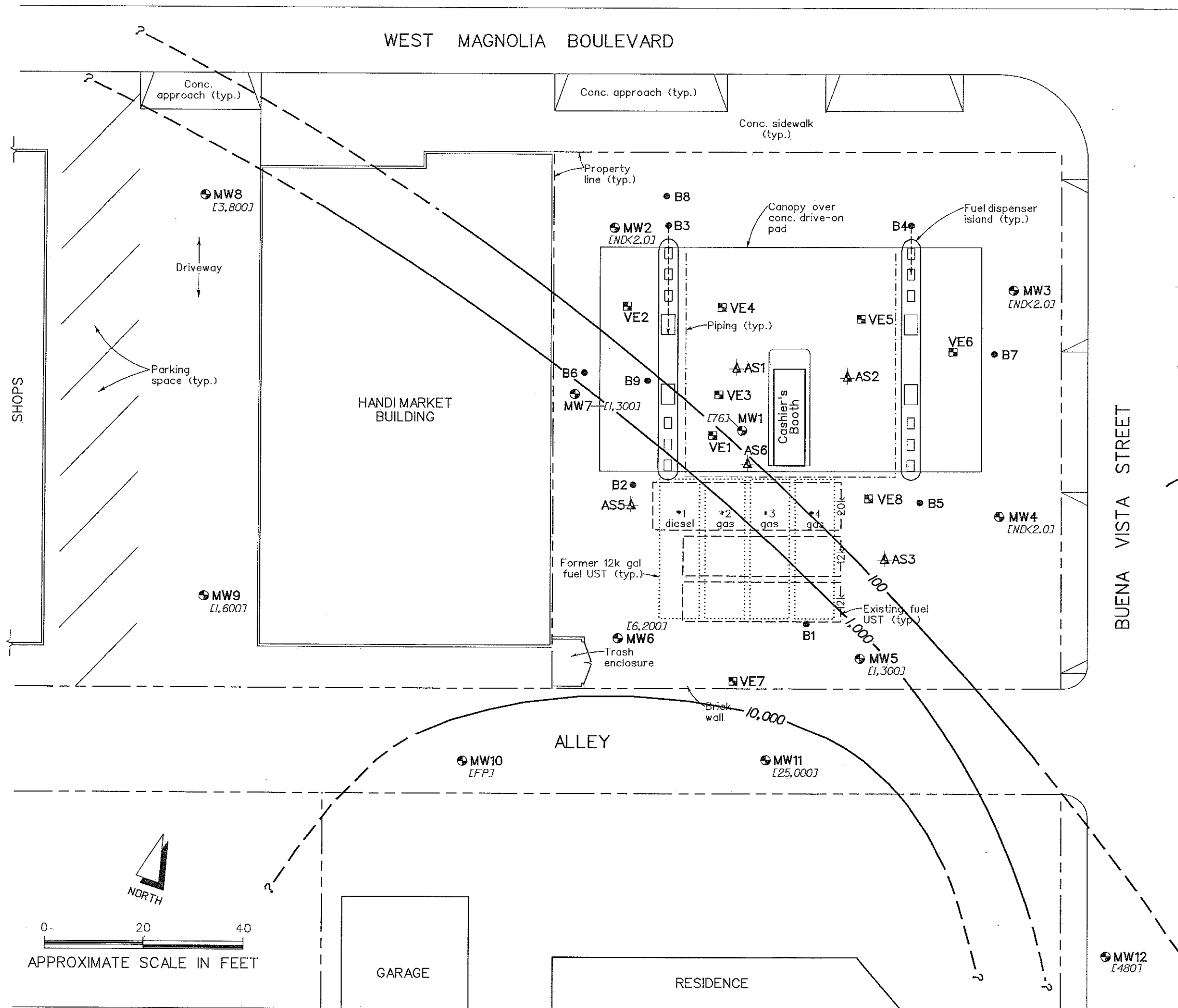
#### Closure Evaluation

- Groundwater is at ~110-115' bgs
- Ongoing AS/SVE system operation removing hydrocarbons at an average of more than one pound per hour
- Weekly SPH removal from passive skimmer in well MW-10. Measured levels of SPH ranged in 1Q from 0.12 feet to 1.2 feet.
- Plume apparently not defined offsite (assessment planned)
- Nearby properties are residential in all compass directions
- Free product is located in alley adjacent to residential land use

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Free product present and not yet removed to extent practicable; Nearby properties are residential in all compass directions; Extent of plume not defined.



## EXPLANATION

- SLANT BORING (Atlas)
- SOIL BORING LOCATION
- AIR SPARGE WELL LOCATION
- VAPOR EXTRACTION WELL LOCATION
- GROUNDWATER MONITORING WELL LOCATION
- With MTBE concentration in groundwater in  $\mu\text{g/l}$ , on December 10 and 11, 2008; ND=not detected above indicated laboratory detection limit; FP=free product in groundwater
- CONTOUR OF EQUAL MTBE CONCENTRATION IN GROUNDWATER (in  $\mu\text{g/l}$ , on December 10 and 11, 2008)

## NOTES:

- 1) All locations and dimensions are approximate.
- 2) Base map from Atlas Environmental Engineering, Inc. drawing no. U14-SIF2, report dated 8/28/1998.
- 3) Groundwater monitoring well locations MW1 through MW3 were surveyed by RdM Surveying Inc. on December 2, 2005 all other wells were surveyed by RdM on 06/06/2006.

UNITED SERVICE STATION # 14  
2500 WEST MAGNOLIA BOULEVARD  
BURBANK, CALIFORNIA

Client: UNITED EL SEGUNDO, INC.

Project No.: 284-26

**FREY ENVIRONMENTAL, INC.**

SITE SKETCH SHOWING  
MTBE CONCENTRATIONS IN GROUNDWATER  
ON DECEMBER 10 AND 11, 2008

Date: FEBRUARY 2009

Figure 7

## Independent UST Case Closure Review

<b>Site Name</b>	Mammoth Mo-Mart
<b>Site Address</b>	3275 Main St Mammoth Lakes, CA
<b>Lead Agency</b>	Lahontan RWQCB (6T)
<b>USTCF Claim No.</b>	12622 (\$350,548)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	4,400	MW-4	Decreasing(v)
Benzene	ND	All wells	Decreasing(v)
MTBE	ND	All wells	Decreasing(v)
TBA	ND	All wells	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Corrective Action Plan required due to contaminant concentrations "orders of magnitude above water quality objectives and the source of the contamination is unclear"... CAP required by 12/15/08. No record of a CAP being submitted.

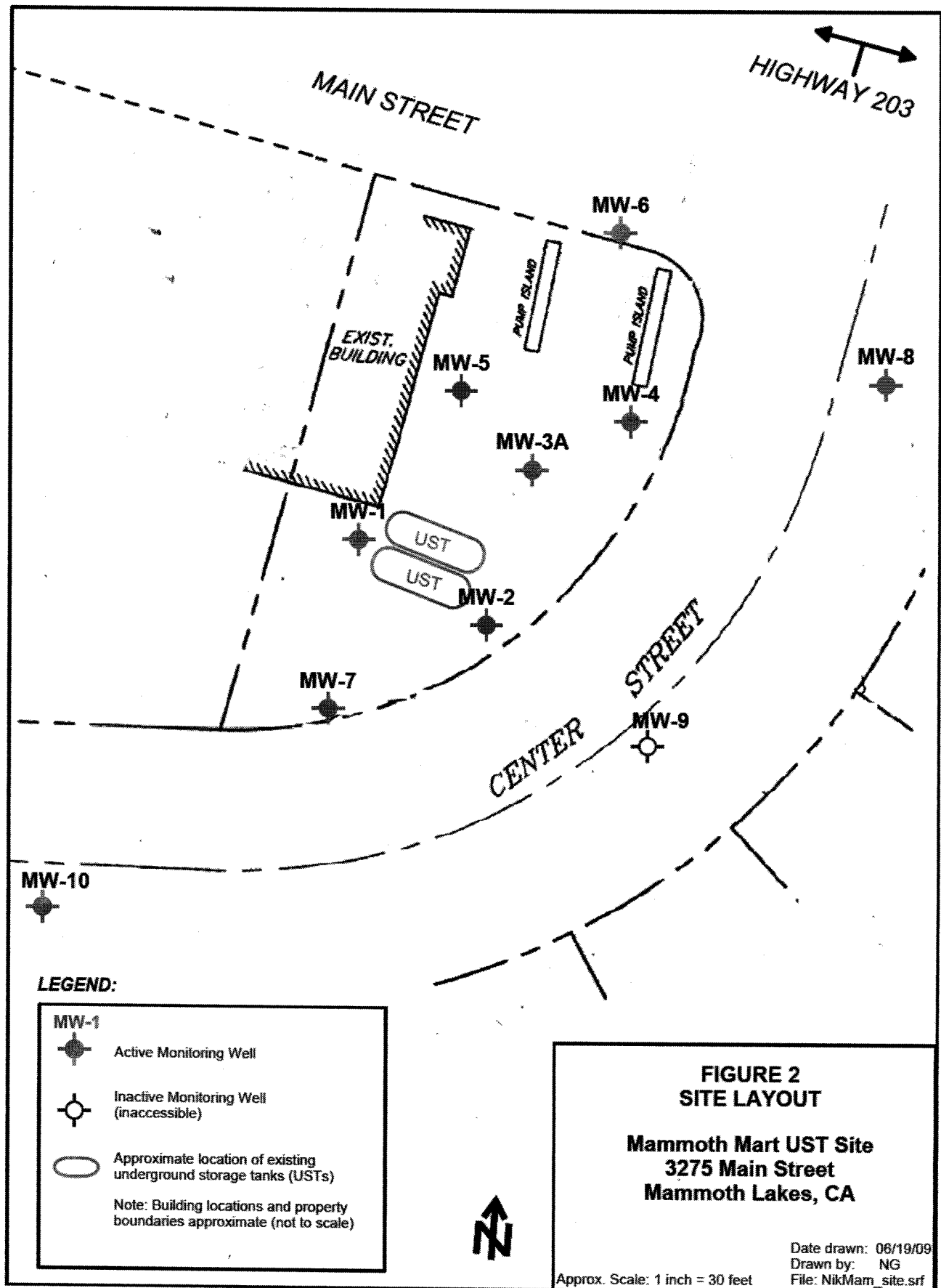
### Closure Evaluation

- Groundwater is at ~20' bgs
- Plume old - no MTBE or TBA, hydrocarbons degraded.
- Contaminants are highly localized in the vicinity of MW-4
- Concentrations are decreasing with respect to time.
- Corrective Action Plan required due to contaminant concentrations "orders of magnitude above water quality objectives and the source of the contamination is unclear"... CAP required by 12/15/08. No record of a CAP being submitted.
- Sensitive Receptors are unknown, however site is located in a predominantly commercial land use area. The nearest residence in the downgradient direction is approximately 800 feet from the site.
- Development of a robust site conceptual model is unwarranted because of low concentrations and the lack of highly mobile constituents of concern such as MTBE.
- TPH concentrations are present well above water quality objectives, but since all other constituents are below laboratory detection limits, the contaminants are unlikely to pose a threat to human health or the environment.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Contaminants are highly localized and restricted to TPH; Concentrations are decreasing with respect to time; Plume is adequately delineated; Site is in a commercial area



## Independent UST Case Closure Review

<b>Site Name</b>	Rapid Gas #35
<b>Site Address</b>	4558 Imperial Hwy W Hawthorne, CA
<b>Lead Agency</b>	Los Angeles RWQCB (4)
<b>USTCF Claim No.</b>	13117 (\$610,455)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	123,000	MW-4	No Trend(v)
Benzene	12,900	MW-2	Decreasing (v)
MTBE	227,000	MW-4	No Trend (v)
TBA	38,300	MW-4	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	Yes
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Interim SVE and GWE system operation ongoing
- Offsite monitoring well work plan approved by regulator: required report by August 4, 2009  
– Unknown if prepared
- Remedial Action Plan (RAP) required by August 13, 2009  
– Unknown if prepared

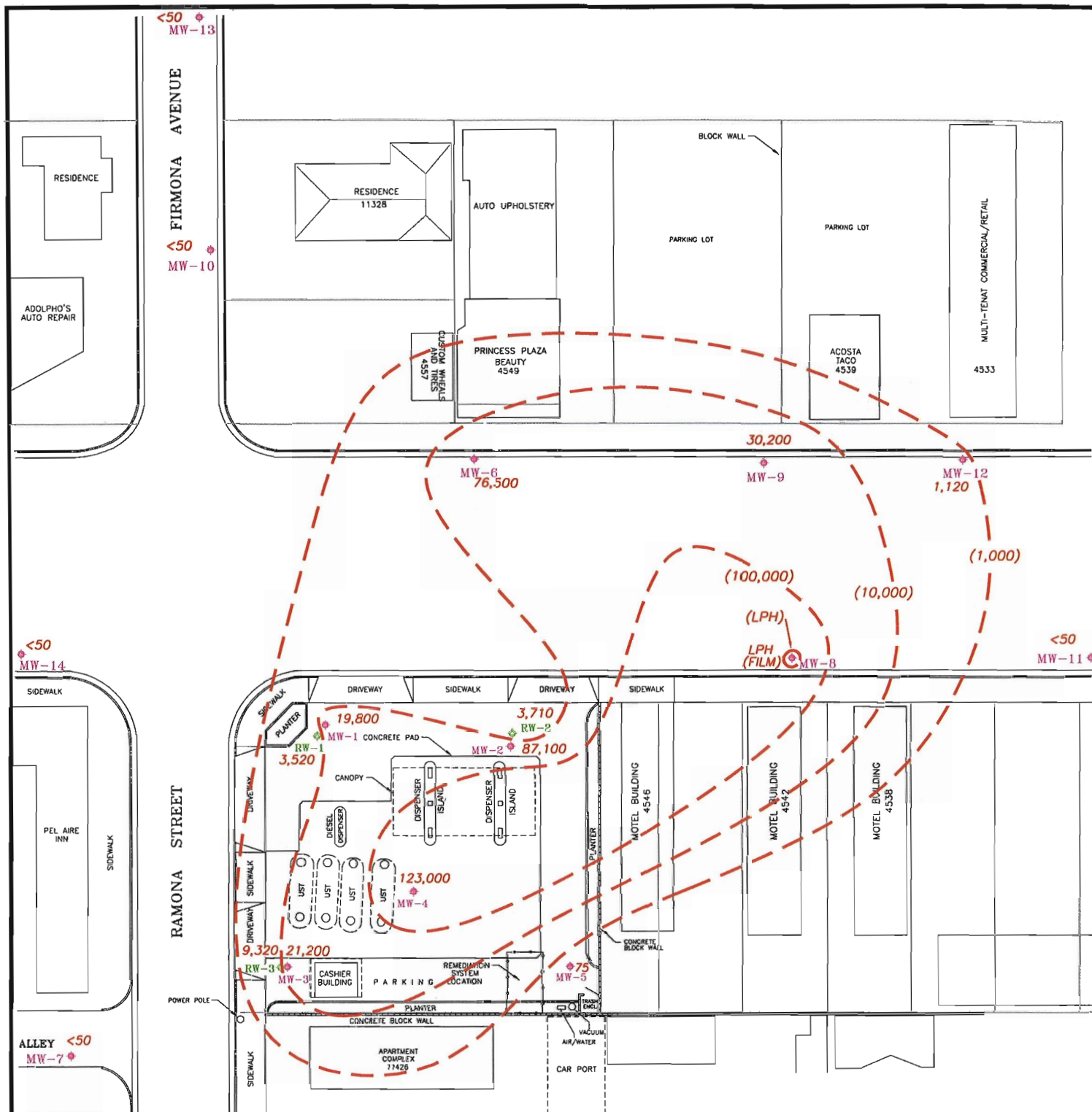
#### Closure Evaluation

- Groundwater is at ~34-39' bgs
- SPH (film) observed in MW-8. Note that MW-8 is approximately 120 feet downgradient of the source area.
- SPH has been observed in many site wells historically. MW-6 contained 0.15' of free product in February 2009; MW-2 contained 0.01' of free product in November 2008
- Concentrations of constituents very high (including MTBE at 123,000 ug/l) and increasing
- Groundwater plume appears to underlie the motel immediately adjacent to the site in the downgradient direction
- Residential properties are located immediately adjacent to the subject site toward the south (crossgradient)

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reasons: SPH appears to be widespread across the property and in the street; SPH has not yet been removed to extent practicable; Contaminant concentrations are well above low-risk concentration criteria; Residential properties are located immediately adjacent to site.



# LEGEND:

- MW-14 4"-DIA. MONITORING WELL
- RW-3 4"-DIA. RECOVERY WELL

123,000

(100,000)

LPH(FILM)

TPHg CONCENTRATIONS IN PARTS PER BILLION (ppb),  
06/26/2009

TPHg ISO-CONCENTRATION CONTOUR (DASHED  
WHERE INFERRED)

LIQUID-PHASE HYDROCARBONS (APPARENT THICKNESS IN FEET)



Design By: EFD

Drawn By: EFD

Date: 09/19/2004

Rev.: 07/10/2009



## RAPID GAS, INC. STATION #35

4558 W. IMPERIAL HIGHWAY  
HAWTHORNE, CALIFORNIA

## TPHg CONCENTRATIONS IN GROUNDWATER

DRAWING NUMBER:  
R3520927

FIGURE 4



- Environmental Products and Services
- Air/Water/Soil Permitting and Monitoring
- Site Assessment and Remediation
- Hazardous Waste Management

3185 AIRWAY AVENUE, SUITE D-1  
COSTA MESA, CA 92626  
PHONE: (714) 890-7129



## Independent UST Case Closure Review

<b>Site Name</b>	Baljian Service Center
<b>Site Address</b>	7490 La Palma Ave. Buena Park, CA
<b>Lead Agency</b>	Santa Ana RWQCB (R8)
<b>USTCF Claim No.</b>	11850, 13909 (\$152,396)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	32,300	PVX-2	No Trend (v)
Benzene	10,900	PVX-2	Stable (v)
MTBE	124	W-1	Decreasing (v)
DIPE	42	MW-5	No Trend (v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor?	775 ft

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- No regulatory correspondence available on GeoTracker
- CAP prepared – recommended Dual Phase Extraction

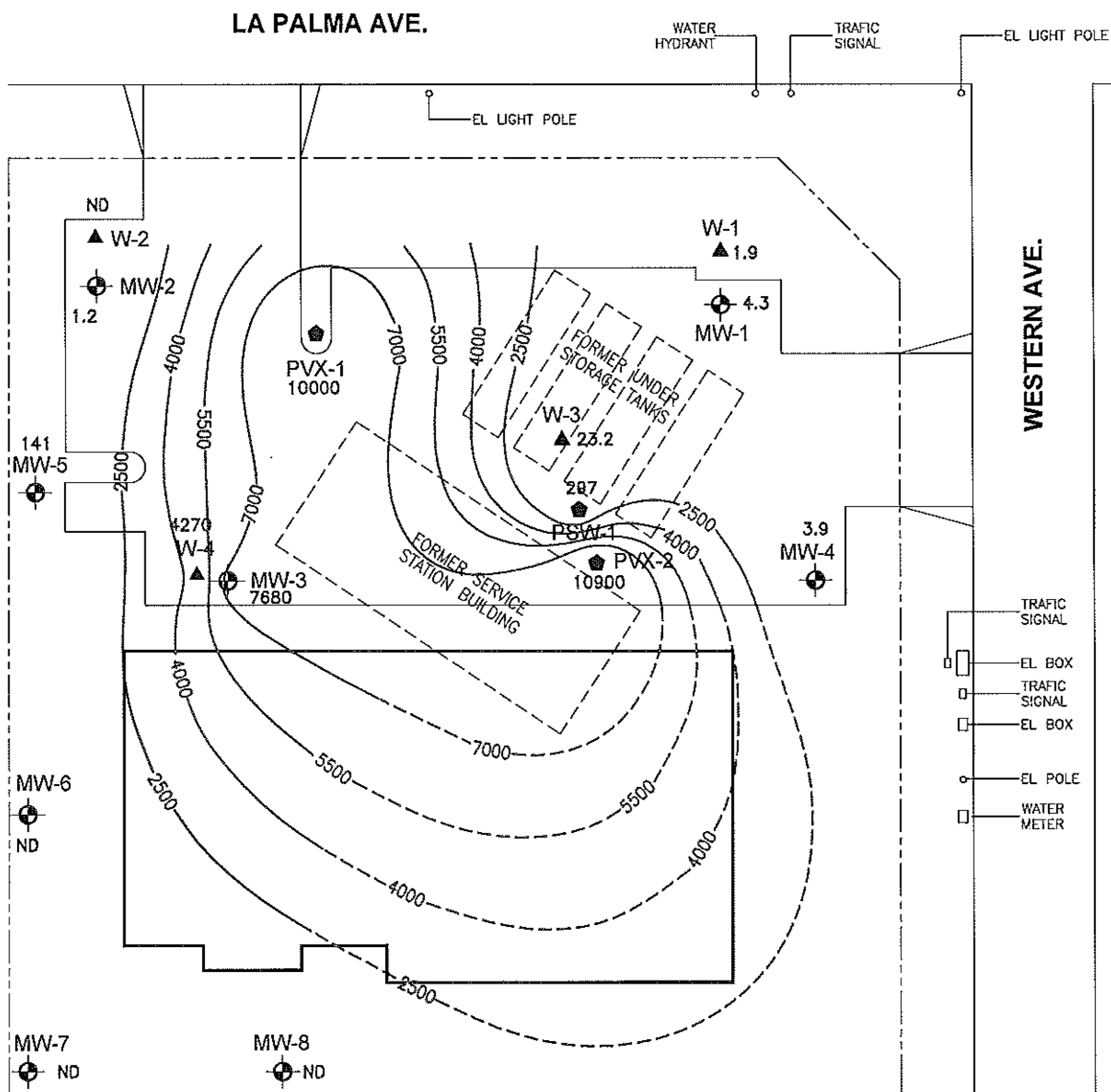
#### Closure Evaluation

- Property was used as an automotive repair facility until tanks were removed in 1987
- It is assumed that the MTBE is not associated with the site since the tanks were removed prior to widespread use of MTBE in California – MTBE appears to be from an off-site source
- TPH plume appears to be stable
- Contaminants likely extend beneath the grocery store directly south of the source area
- Property is located adjacent to Knott's Berry Farm and a school.
- Groundwater is at ~11-12' bgs

#### Recommendation

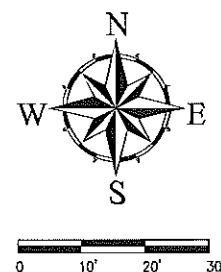
Closure not appropriate at this time. Warrants further regulation.

Reason: Contaminant concentrations in excess of low-risk criteria.



# **LEGEND**

- Groundwater Monitoring Wells (BW Environmental)
- Groundwater Monitoring Wells (ENV America)
- Groundwater Monitoring Wells (AAKO)
- Vapor Extraction & Air Sparging System
- ISOPLETH CONTOURS FOR BENZENE
- CONCENTRATION, (  $\mu\text{g/L}$  )
- NOT DETECTED



**A.C.C.E.S. INC.**

**ENVIRONMENTAL ENGINEERING**

2034 COTNER AVENUE, SUITE 408  
LOS ANGELES, CA 90025  
Tel 310-479-7183 • Fax 310-479-1286  
www.accesengineering.com

TITLE: PLAN VIEW OF SITE  
ISOPLETH CONTOURS FOR BENZENE ( $\mu\text{g/L}$ )

PROJECT: QUARTERLY GROUNDWATER MONITORING  
2nd QUARTER 2009

SITE: PHILTON PROPERTIES  
7490 LA PALMA AVE. BUENA PARK, CA 90620

OWN BY:	GS	SCALE:	AS SHOWN
CHK BY:	HA	DATE:	05/27/09
PROJECT No.	20066	DWG NO:	FIGURE 5

## Independent UST Case Closure Review

<b>Site Name</b>	Alvidres 76 Service Station (aka Alvidres Unocal)
<b>Site Address</b>	100 West Front Street Buttonwillow, CA
<b>Lead Agency</b>	Kern County
<b>USTCF Claim No.</b>	14066 (\$106,840)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	3,300	DPW-1	Decreasing(v)
Benzene	160	DPW-1	Decreasing(v)
MTBE	180	DPW-1	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Consultant recommended (3/17/08) and regulator approved (9/10/08) SVE, DPE and AS pilot testing, feasibility study, conceptual site model, and corrective action plan

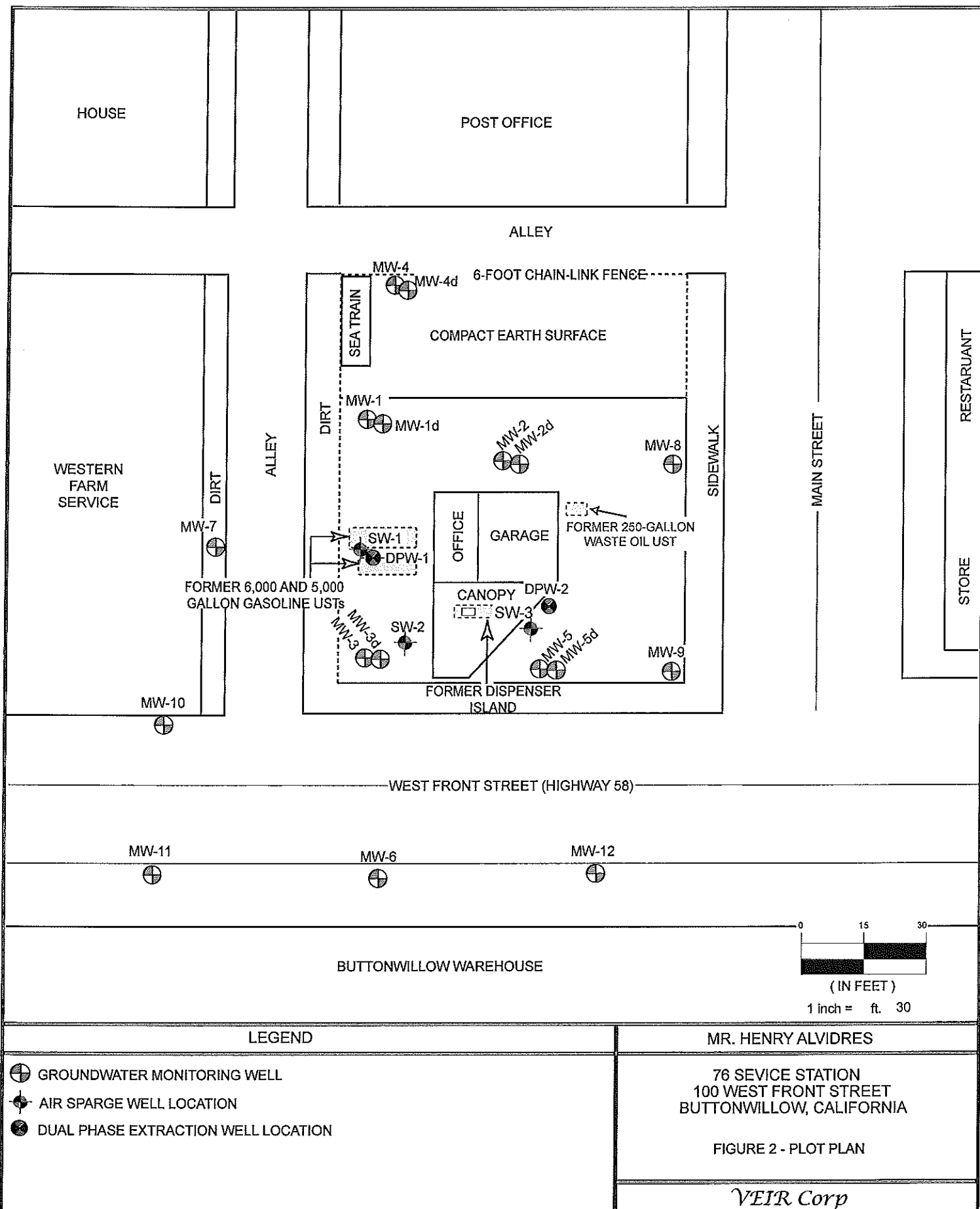
#### Closure Evaluation

- Groundwater is at ~35' bgs
- Due to dropping groundwater level, several wells no longer intersect the groundwater table. Replacement wells have been installed in selected locations
- Soil concentrations from recent well installation report modest concentrations in source area (former UST pit): up to 6,200 mg/kg TPHg, 16 mg/kg benzene, 5.4 mg/kg MTBE
- Plume not adequately characterized. Groundwater plume undefined in most directions, though concentrations appear to be decreasing over time.
- Residential property 150 feet from source area (NW of property)
- Not known if there are water supply wells in vicinity of site.

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Site not adequately characterized; Distance to receptors unknown



## Independent UST Case Closure Review

<b>Site Name</b>	Gas 4 Less
<b>Site Address</b>	924 10th Street Antioch, CA
<b>Lead Agency</b>	Central Valley RWQCB (5S)
<b>USTCF Claim No.</b>	14280 (\$548,811)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	2,000	MW-5	Decreasing(v)
<b>Benzene</b>	300	MW-5	Decreasing(v)
<b>MTBE</b>	220	MW-5	Decreasing(v)

Notes: (v) – Visual evaluation of trend  
(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	>2,000' upgradient

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Site under Cleanup and Abatement Order (CAO) dated Nov. 8, 2005
- Dual Phase Extraction: Started June 2008. Terminated January 2009 due to suspension of claim

### Closure Evaluation

- Groundwater is at ~8' bgs
- Residential properties adjacent to site in downgradient direction (North)
- Groundwater batch extraction performed from Dec. 2006 to April 2007
- Concentrations decreasing over time (as of the 4Q 2008 report)
- TCE reported in three wells - likely from former dry cleaning facility that was located upgradient of the site.
- No downgradient definition of TPHg, benzene or MTBE
- DPE system in operation since June 2008. DPE system removed approximately 3,050 pounds of TPHg, 74 pounds of benzene, and 4 pounds of MTBE in 2008. System not in operation since before January 1, 2009 due to financial hardship.
- While TPHg and benzene concentrations are relatively moderate at this time, this is likely due to the performance of Dual Phase Extraction at the site. Pre-remediation concentrations of benzene = 6500 ug/L (MW-5, 4/30/08).
- Continued operation of the system is reasonable, and case should not be closed until further mass is removed.

### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Site concentrations have declined to low-risk criteria while DPE system was in operation. Because all infrastructure is in place, the system should be restarted to complete remediation. Groundwater plume likely underlies residential properties to the north.



# LEGEND

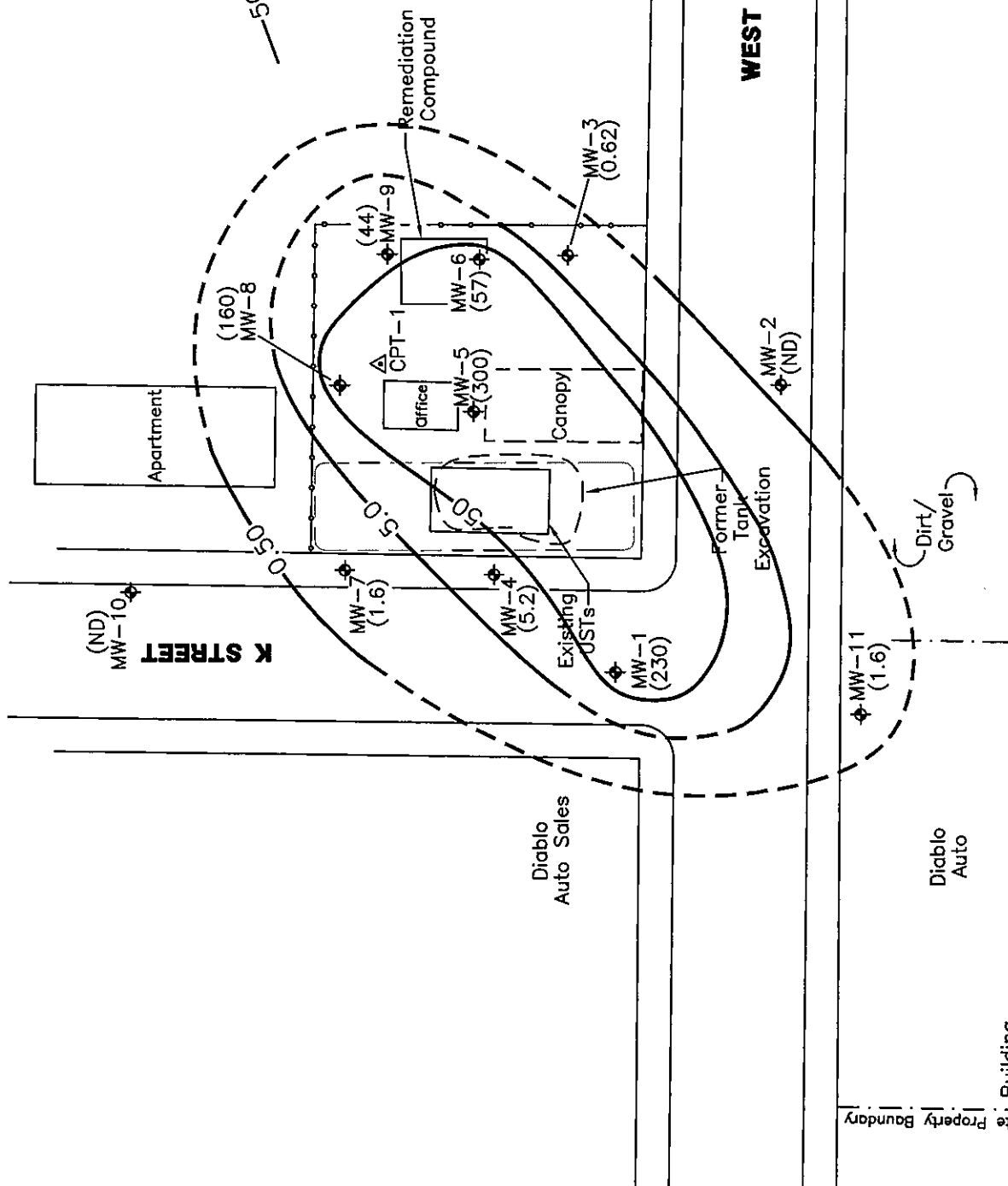
Monitoring Well Location

Cone Penetrometer Test

Concentration Of Benzene In Groundwater Measured In ug/L

Line Of Equal Concentration Of Benzene In Groundwater Measured In ug/L; Dashed Where Inferred

(ND) Not Detected



## BENZENE IN GROUNDWATER ISOCONCENTRATION MAP: OCTOBER 16, 2008

Gas For Less  
924 10th Street  
Antioch, California

DRAWN BY: D. Alston  
DATE: 1/12/09

### REVISIONS



FIGURE  
**5**

PROJECT NUMBER:

MSH52.001

## Independent UST Case Closure Review

<b>Site Name</b>	Santa Cruz Texaco (a.k.a. Former Exxon 7-0114)
<b>Site Address</b>	1024 Water Street Santa Cruz, CA
<b>Lead Agency</b>	Central Coast RWQCB (3)
<b>USTCF Claim No.</b>	15232 (\$414,058)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	148	STMW-16	Increasing(v)
Benzene	ND	all wells	Decreasing(v)
MTBE	175	STMW-16	Increasing(v)
TBA	448	STMW-6	Decreasing(v)

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	No
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- Work plan for soil vapor and soil sampling required by April 20, 2009 (unclear if performed)

### Closure Evaluation

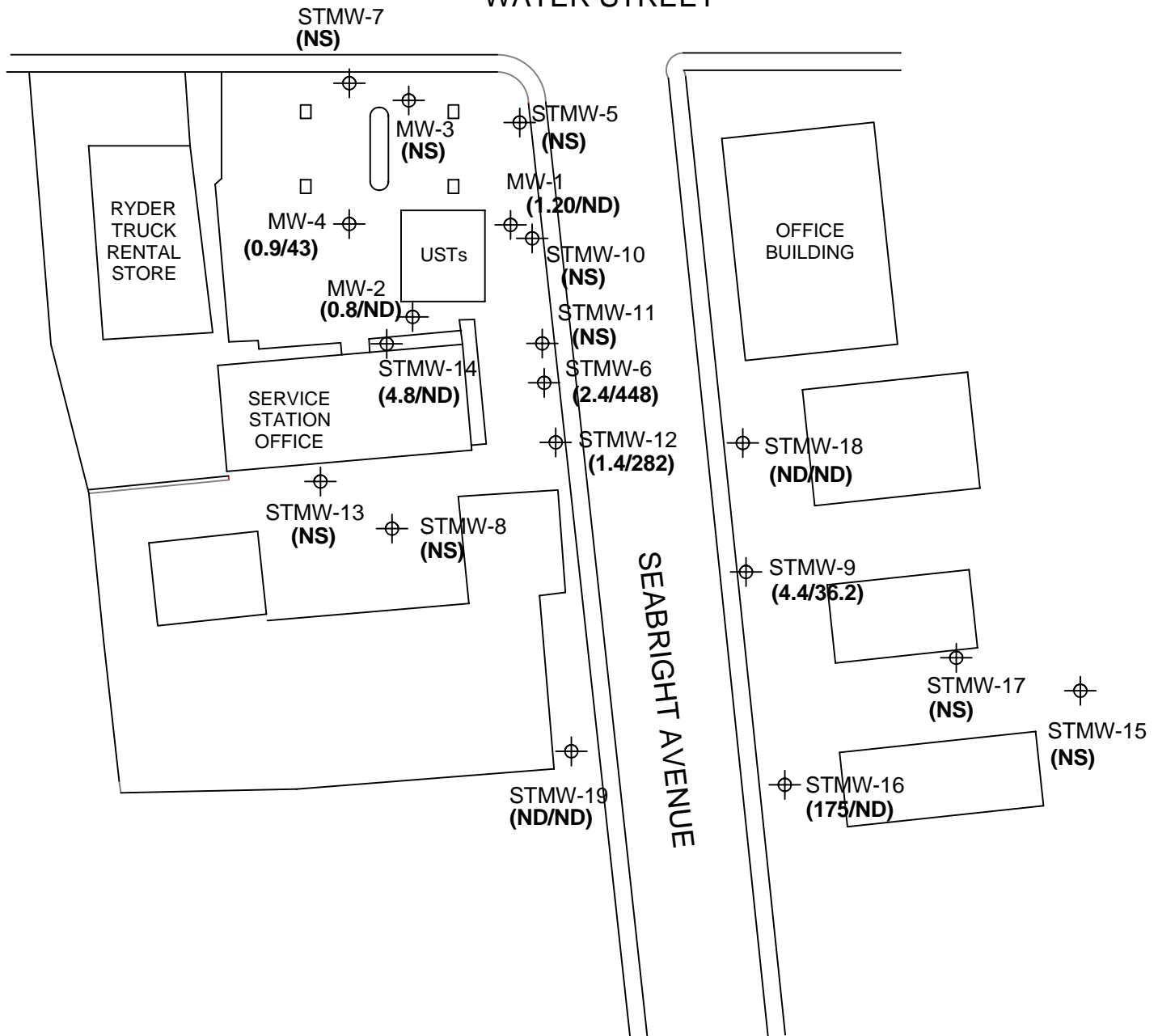
- Groundwater varies seasonally from ~5-6' in 1Q to ~7-8' in 3Q
- Overexcavation conducted in 1996
- Soil concentrations range up to 1,200 mg/kg TPHg, 0.62 mg/kg benzene and 10 mg/kg MTBE. Soil impact is limited to on-site.
- Concentrations of petroleum hydrocarbons and fuel oxygenates negligible on-site; detections of MTBE and TBA are found in the furthest downgradient wells, indicating that the plume is likely detached from the original source area.
- Properties in the downgradient direction are commercial; the nearest residential property appears to be 1000' from the subject site. It is noted that the MTBE and TBA plume has migrated at least 200' from the subject site.
- It is unclear where the nearest sensitive receptor is with respect to the site. If the distance to the receptor is appreciable, then the concentrations of MTBE and TBA are unlikely to pose a threat to human health. Until a sensitive receptor survey is performed, the site cannot be considered low risk.

### Recommendation


Closure not appropriate at this time. Warrants further regulation.

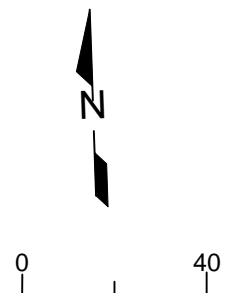
Reason: Plume is migrating; Site characterization is inadequate (undefined in downgradient direction); Location of nearest receptors unavailable in GeoTracker.

# WATER STREET



## EXPLANATION

-  GROUNDWATER MONITORING WELL
- (ND/ND)** MTBE / TBA CONCENTRATIONS, (micrograms per liter)
- ND** NOT DETECTED BY LABORATORY METHOD
- NS** NOT SAMPLED THIS QUARTER



## MTBE, TBA Groundwater Concentration Map, 12-16-08

Prepared For:  
Former Exxon 7-0144  
1024 Water Street  
Santa Cruz, CA

Prepared by: JC  
REF:  
FIG 5\_Conc Map

FIG:  
**5**

## Independent UST Case Closure Review

<b>Site Name</b>	Buy-N-Save Market
<b>Site Address</b>	225 7th St Los Banos, CA
<b>Lead Agency</b>	Merced County
<b>USTCF Claim No.</b>	15652 (\$331,733)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
<b>TPHg</b>	ND<5,000	all wells	No Trend(v)
<b>Benzene</b>	ND<50	all wells	No Trend(v)
<b>MTBE</b>	5,700	MW-2	No Trend(v)
<b>TBA</b>	ND<500	all wells	Decreasing(v)

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	UNK
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	No
Has Site been Adequately Characterized?	No
Drinking Water Wells Potentially Impacted?	UNK
Water Quality Objectives Likely Achieved Before Resource Used?	UNK
Land Use Residential Within Probable Plume Migration Area?	Yes
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	UNK
Contaminants Likely Pose Insignificant Risk to Environment?	Yes

#### Regulatory Status & Directives

- Semi-Annual Groundwater Monitoring
- AS/SVE is planned - construction was planned for early 2009

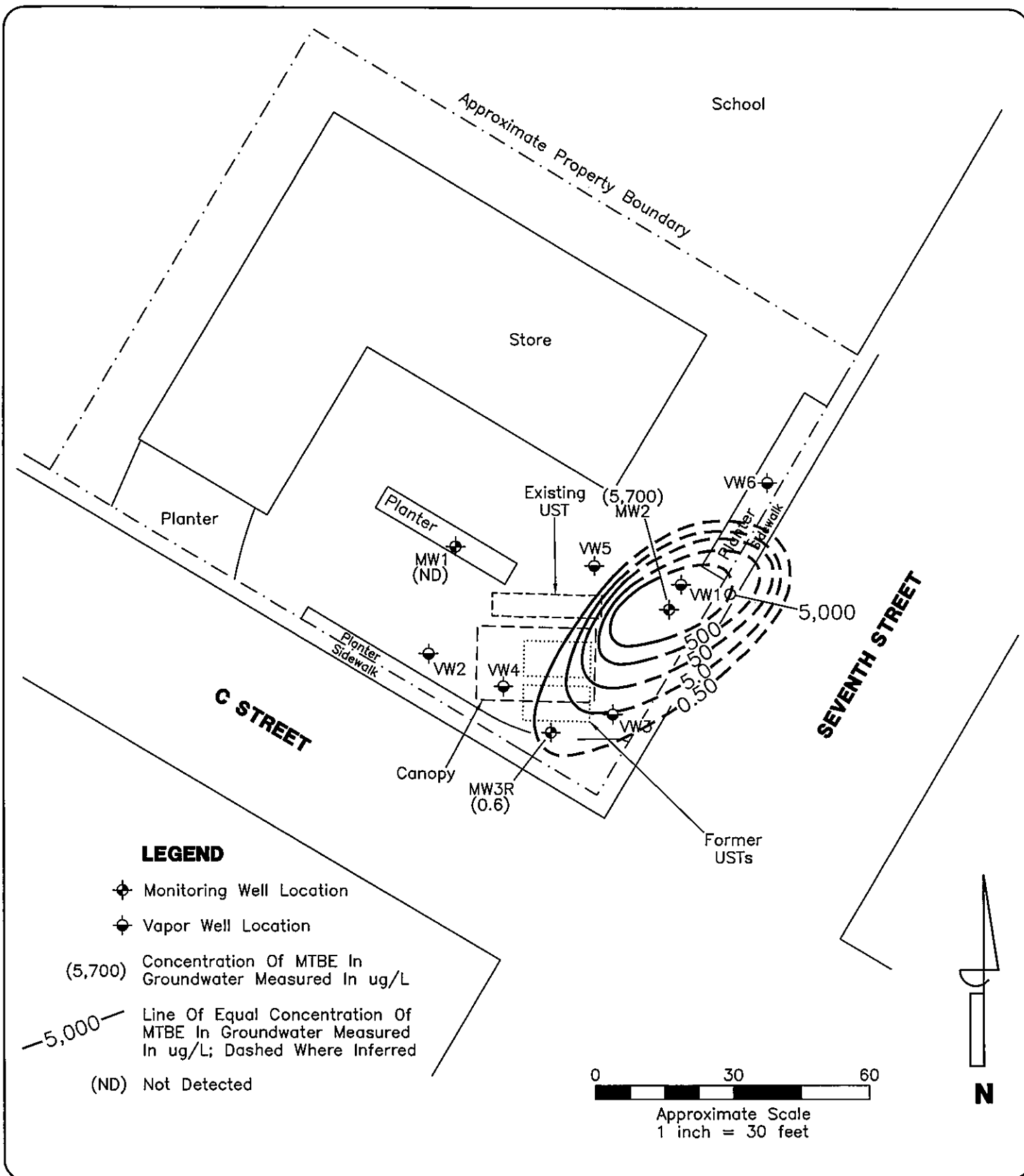
#### Closure Evaluation

- Groundwater is at ~23-24' bgs
- Appears to be predominantly an MTBE release; TPHg and benzene have historically been low to non-detect
- Groundwater concentrations of MTBE undefined in the downgradient (NE) direction. The highest detections MTBE to be found in the most downgradient well, MW-2.
- MTBE plume appears to be mobile – drifting downgradient from MW-3 toward MW-2
- Further plume delineation and remediation are warranted.
- Residential properties are present approximately 500' downgradient of site
- Performance of a sensitive receptor survey is warranted, if not already performed

#### Recommendation

Closure not appropriate at this time. Warrants further regulation.

Reason: Plume is not defined; Plume does not appear to be stable; Location of nearby receptors not identified



	DRAWN BY: D. Alston DATE: 5/27/09	<b>MTBE IN GROUNDWATER ISOCONCENTRATION MAP, APRIL 15, 2009</b>	FIGURE <b>4</b>
	REVISIONS		
		Buy-N-Save Market 225 Seventh Street Los Banos, California	PROJECT NUMBER: ROC58.001

## Independent UST Case Closure Review

<b>Site Name</b>	Downtown Tire & Auto Repair
<b>Site Address</b>	550 Main St Red Bluff, CA
<b>Lead Agency</b>	Central Valley RWQCB (5R)
<b>USTCF Claim No.</b>	16420 (\$129,534)

Constituent Of Concern	Current Max Concentration (ug/L)	Well	Trend
TPHg	4,800	MW-2	Stable (v)
Benzene	32	MW-3	Decreasing(v)
MTBE	ND	all wells	--
TBA	ND	all wells	--

Notes: (v) – Visual evaluation of trend

(k) – Kendall Trend test

Site Specific Risk Profile	
Human Health Risk Assessment Been Performed?	No
Distance to Nearest Receptor	UNK

Low Risk Evaluation Criteria	
Free Product Present at Site?	No
Plume Stable and Not Migrating?	Yes
Has Site been Adequately Characterized?	Yes
Drinking Water Wells Potentially Impacted?	No
Water Quality Objectives Likely Achieved Before Resource Used?	Yes
Land Use Residential Within Probable Plume Migration Area?	No
Impacted Groundwater Discharges to Surface Water Body?	No
Contaminants Likely Pose Insignificant Risk to Human Health?	Yes
Contaminants Likely Pose Insignificant Risk to Environment?	Yes



### Regulatory Status & Directives

- Quarterly Groundwater Monitoring
- Regulatory agency issued a Cleanup and Abatement Order (CAO) on 6/25/07 requiring submittal of a "draft" Corrective Action Plan (CAP)
- Unknown if CAP has been prepared

### Closure Evaluation

- Groundwater is at ~16-19' bgs
- This case to be an old pre-MTBE release of gasoline. The benzene fraction appears to be highly degraded.
- Surrounding land use is well developed commercial; residential properties are not in the immediate vicinity of the site.
- January 2007 soil vapor survey reports hydrocarbons not detected in soil vapor.
- Consultant recommends continuing quarterly sampling to further evaluate groundwater trends and variations, so that an appropriate remediation plan can be implemented.
- Downgradient extent of TPHg not defined. Downgradient wells MW-1 (to the northwest) and MW-7 (to the northeast) reports concentrations of 650 ug/l and 1,100 ug/l of TPHg, respectively. Nevertheless, the plume is considered to be adequately characterized because TPH is relatively immobile and cannot be reasonably expected to migrate significantly beyond site boundary
- Unknown if a receptor survey has been performed.

### Recommendation

Should be granted No Further Action status; does not warrant further regulation.

Reason: Contaminants are relatively immobile and below low-risk concentration criteria; Plume is adequately defined; Soil Vapor Survey results do not indicate unacceptable risk to indoor air quality; Surrounding properties are not residential.

